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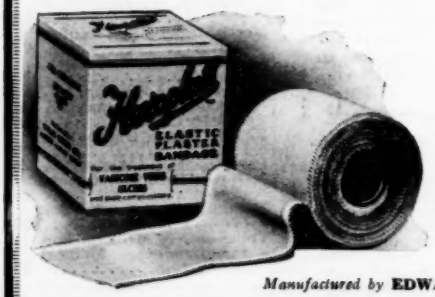

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ADDRESSES AND ORIGINAL ARTICLES

THE ÆTIOLOGY OF CARCINOMA.*

BY J. J. M. SHAW, *M.C.*, M.D., F.R.C.S., F.R.S. EDIN.,
ASSISTANT SURGEON TO THE ROYAL INFIRMARY, EDINBURGH: LECTURER IN SURGERY AND ASSISTANT TO THE PROFESSOR OF SURGERY IN THE UNIVERSITY OF EDINBURGH.

THE field of cancer investigation is wide; the workers therein are many and of great diversity in training and outlook. The extent and many-sidedness of the problem render its presentation a matter of considerable difficulty. This difficulty lies mainly in the comprehension and proper coördination of the vast amount of relevant information which is available and not, as is sometimes suggested, in the vastness of our ignorance of the nature of the process. Whichever view be held, it is advisable for each of us to formulate the question from time to time, "What do I understand by the term Cancer?" and to attempt to coördinate our ideas so that we may assess the value of new observations in the chain of causative factors. An effort in this direction is preferable to the attitude of awaiting the discovery from some source, as yet undiscerned, of a single and intimate cause of cancer, because it has become almost certain that no such single proximate cause exists.

In traversing the wide range of fact and opinion which demand consideration, there is a choice of two methods. Either a narration may be given of a long series of observations, experiments, and theories, or an attempt may be made to weave these into some measure of sequence so that the gaps in our knowledge may be emphasised. At a time when cancer investigation has lately suffered the loss of Archibald Leitch, it may not be considered too presumptuous if an attempt is made, by choosing the second method, to follow his precept to place our facts in order.[1] I hope it may thus be possible to provide a thread on which the more important observations may be linked together and, in this form, be more easily understood and remembered.

Growth and Independence of the Cell.

We will regard carcinoma as the process of growth in cells which have either failed congenitally to come under those influences which determine cell function and form, or which, after being subject to such differentiating influences, have become independent of them owing, apparently, to a prolonged change in environment.

A definition of cancer as a disease would demand a different statement in which the tendency towards fatality in the host and the apparent anarchism of the carcinomatous cell group assume prominence. In a consideration of ætiology, however, it is desirable to put aside this "malignant" aspect of the question—i.e., the effect upon the host— and to postulate an essential "naturalness" in the process as a physiological response to the influences which act upon the cell. The possibility of lawlessness or vagarious action on the part of a living cell would at once render a discussion of causation entirely sterile. The ideas of "unnaturalness" and "lawlessness" have drifted into the study of the cancer problem by strained analogies with the conduct of beings endowed with the power of thought.

The neoplastic process is founded upon the potentiality for independence of all the cellular entities which, in their aggregation and sufficient coördination, give us a composite living body. The cell is primarily an individual and secondarily a citizen. The tissue culture slide, the persistence of cell life for several days after somatic death, the free grafting of tissues, the vitality of the spermatozoon, and the self-sufficiency of the ovum—all these proclaim a capacity for survival of cells in the disjoined state, either when specially prepared for separation as are the reproductive cells or when artificially separated as in the other instances. The capacity for growth in the living cell should not be regarded as a specialised function or as an alternative to other specialisations. The view of M. T. Burrows, that the cell may swing now to growth and now to other function according to the presence of a growth stimulant (archusia) in excess, or a work stimulant (ergusia), cannot be fully maintained. Cramer expresses the position clearly when he says:

> "The similarity between the process of growth and other manifestations of cell life suggests that growth should be looked upon simply as a property inherent in living protoplasm in the same sense as metabolism, contractility and irritability. This is by no means a new conception. It is emphasised again because the conclusions drawn by many recent workers on the growth problem frequently suggest or imply that growth is a property which can be added to or taken away from living protoplasm. Such expressions as cells 'losing' or 'acquiring' the power of growth suggest that cells contain or possess something which is absent from cells which are said to have 'ceased to grow,' and a similar conception is implied in the term 'growth-substance.'"[2]

Warburg expresses it thus: "The resting condition of adult tissue is only apparent; in reality it is a condition of equilibrium in which growth and decay counterbalance one another."[3] In Nicholson's words: "Excessive growth and therefore tumour formation is one of the physiological potencies of every healthy cell."[4]

DIFFERENTIATION.

We are prone to regard a specialisation of function and a corresponding differentiation of structural form as the natural condition of the cell, especially the epithelial one. Should these not rather be regarded as an imposition upon the individual for the communal welfare, entailing a sacrifice of its natural proclivity towards free growth and reproduction which are its essential properties? The living cell is a plastic and versatile entity which is capable of rapid reversion towards its true primitive form, as shown when the leash of control is removed in the urgencies of repair.

Differentiation is not manifest in the earliest stages of the developing embryo. It may disappear temporarily during the processes of repair. May it disappear finally if factors resembling those responsible for the proliferations of repair are allowed to act over a prolonged period of time so that an inveterate habit is established? Ewing states that inflammatory hyperplastic processes pass by insensible gradation into neoplastic growth according to our present analysis.[5]

The group of cells which is irresponsive to the differentiating influences is not extruded from the body. In their capacity for acquiring sustenance they may alter the metabolism of the host. As Carter Wood remarks: "The fact that cancer cells are a real independent life inside the body, just as much as the fœtus is, and perfectly adapted to the soil in which

* A post-graduate lecture delivered at Edinburgh.

they grow, does not seem to be fully recognised." [6] Such a growth induces changes in the blood and other tissues of the host, and one of the chief difficulties in our present state of knowledge is to decide how far these manifestations are causal in nature and how far they are secondary or incidental. In a consideration of ætiology we must be careful that changes such as those observed in the blood which result from the presence of the independent growth are not described as factors which cause that independence until their exact interpretation is determined. A study of the blood and excretory changes in pregnancy yields valuable information and provides useful tests, but deductions in regard to fœtal origin have not been made from them. With full recognition of the value of their work, I shall refrain from discussing the observations of such workers as Shaw Mackenzie, Bendien, Haddow, Maisin, Pacetto, and many others who have studied the serological reactions, &c., in cases of established cancer.

Three Ways in which Carcinoma is Produced.

It has been indicated that the state of non-differentiation may be shown either by cells which have never reached maturity of structural form or by the descendants of cells which have been differentiated but which have been altered by some means so that differentiation has been modified or has disappeared. A recognition of this distinction is important and serves to prevent the stultification of discussion which occurs when the expositor of an extrinsic cause is assailed with the question, "What can your extrinsic cause have to do with, say, the renal blastoma of the infant?"

We may succeed in rendering the question less difficult if we describe three different methods of production of carcinoma, a grouping which has the additional advantage of bringing the various branches of experimental work into perspective with the human manifestations:—

(1) *Implantation*, in which a growing carcinoma is transferred from one host to another and continues to grow without apparent modification.

(2) *Continuing*, in which an embryonic cell group fails to come under the influence of the mechanism of differentiation and continues to grow in its natural primitive state and to reproduce in the manner of undifferentiated multicellular organisms. In this group the outstanding example is the renal blastoma or embryoma, which, often, cannot be accurately classified as carcinoma or sarcoma because the stage of differentiation into germinal layers has not been attained.

(3) *Conversion*, in which a single differentiated cell or cell group becomes altered under some change in environment so that its previous differentiation and specialisation disappear or become modified. In contrast to the processes of repair, this de-differentiation remains established.

IMPLANTATION.

The implantation group is interesting and demands a brief consideration, although we are dealing with cells which have undergone their carcinomatous mutation in another host. The corresponding experimental work, in which Russell, Woglom, and Murray have taken a prominent part, throws much light upon stroma reaction, species limitation, and individual refractoriness.

A true implantation consists of the transfer of living carcinomatous cells into a host in which they continue to thrive in situations in which epithelial tissue is not normally found. There are definite limitations to the capacity of the neoplastic cell in taking root in this way. The species limitation is extremely strict and in only one situation has a successful transplant been made from one species to another, when a mouse carcinoma was transferred to the brain of a rat. A few experimental tumours have become celebrated and are passed from one laboratory to another owing to their ready acceptance on implantation, which places these tumours almost on the same plane as the blood of a universal donor. When the destruction of an implant occurs, it is due to a fibrosis aided, apparently, by the lymphocytic flood, in H. Wade's phrase, which invariably appears. In a sub-effective excitation of the connective tissue, the stroma which forms appears to be suborned to the service of the implant and, in place of a strangling and desiccating exterminant, it becomes an intermediary in the supply of such fluid as the carcinomatous cells require. The influence of the fibrous barrier is shown in the arresting effect of an old pleuritic adhesion, occasionally in marked degree at the periphery of a melanocarcinoma and in other instances. The carcinoma cell may be reduced almost to the level of a spore, as shown by Heiman, of the Crocker Research Laboratory, when he implanted a very active carcinoma into the centre of a slow-growing transplantable fibroma of the rat.[7] In this fibrous prison the carcinoma survived but did not increase. On cutting up the composite tumour and liberating the contained cells, malignancy was rapidly demonstrated. Murray[8] has demonstrated that the resistance of the host is raised by the pre-existence of a cancerous implant which has been removed, and Lumsden[9] has claimed to raise resistance by some of the products of tumour autolysis. It is interesting to consider the possibility of a lowering of the anti-epithelial resistance in pregnancy which, as it permits the invasion of the trophoblast in the uterus, might also allow the acceleration of tumour growth in other parts, as has been frequently recorded. Although H. Ribbert's conception of tissue tension does not carry us far in relation to ætiology, it is of value as a description of connective tissue resistance against a carcinomatous invasion either by implant from another host or at the stage of irruption of the carcinoma cell from the epithelial zone.

This defence against epithelial invasion is, of course, evident with implants of normal epithelial tissue. If a small portion of a truly cut Thiersch graft be submerged into a connective tissue bed, it is invariably destroyed by fibrosis. It is only when a portion of "whole" skin, with its defensive barrier of corium, or an intact sebaceous or sudoriferous gland is disjoined and submerged that an implantation cyst is formed. In operative work the seeding of implants only occurs in conditions of malignancy, and the precautions against it, which Sampson Handley insists should be part of the ritual of every operation in cancerous cases, are never required in other work except the border states of independence such as the villous papilloma of the bladder.

In contrast to the fairly common observation of homo-transplantation by seeding, especially in breast work, it may well be understood that the transfer of a neoplasm from one human host to another will be as rare as its undesirability can make it.

Lecène and Lacassagne describe the case of a French student who accidently inoculated his palm with tumour cells from a case of breast carcinoma by the breaking of a syringe while he was in the act of withdrawing some exudate from the patient after operation. A neoplasm of the palm developed at the exact site of injury and a glandular metastasis made amputation of the arm necessary. On section the malignant nature of the growth was unquestionable.[10]

Parkes Weber showed recently to the Royal Society of Medicine the carcinomatous liver of an infant, aged 10½ months, whose mother had died of melanotic carcinoma three months after delivery. The mother had been operated upon, 18 months before delivery, for melanotic carcinoma of the thigh. He described the case as the first reported

of transmission of a malignant neoplasm from mother to child by intra-uterine inoculation.[11]

All the recorded intentional attempts to transplant human tumour tissue have been unsuccessful. Some were destroyed by fibrosis in the host. In the most recent attempt, which was reported to the German Surgical Congress in 1926 by Kurzahn, of Königsberg, the graft failed to grow. This surgeon transplanted cancerous tissue from a breast into his own forearm. Examinations made at periods of six days, two weeks, and six weeks showed only signs of absorption.[12] In remarking that the result was quite different from those obtained in animals, he must have failed to remember that only a small proportion of spontaneous animal tumours can be successfully grafted and that the routine experimental work with a high proportion of successful results is carried on with subcultures of tumours of exceptional resistance to the destructive agents in the host.

CONTINUING.

In amplifying the description of the group which we have termed Continuing the renal tumour forms the chief basis, particularly in its brilliant description by Nicholson in his work on "The Nature of Tumour Formation." The failure of differentiation in these tumours is attributed, not to a fault in the cells, but to a lack of the appropriate physiological stimulus to differentiation, such as an aberration in development of the capillaries.

As Nicholson affirms: "Cells will feed, grow, divide, and multiply for ever unless they are compelled by their environment to make the effort to differentiate. This has been established by experimental methods in tissue culture." [13] Some points from the summary of his analysis of the embryonic tumours of the kidney are:—

(1) They are congenital and represent enormously enlarged remnants of the renal blastoma of the embryo.
(2) They do not arise in cell rests but are cell rests.
(3) Their actively growing cells have always remained at an early stage of embryonic development and have never proceeded beyond this stage of differentiation.
(4) These cells have retained the primitive physiological function because they were prevented from undergoing the process of differentiation.
(5) The inhibiting influence is not an inherent fault in the cells but depends upon an anomaly of the environment to which they were subjected at an early stage of their life history.
(6) There is evidence for the assumption that this anomaly is of the nature of a defect of tissue correlation which may have ceased to act long ago.

MacCarty, in a paper upon the Cancer Cell and Nature's Defence Mechanism, has described tissue differentiation in the human body as occurring in such a way that it may be divided into three recognisable stages.[14] First, there is seen the establishment of the general alignment of the cells which is shown in the normal arrangement of adult tissue, the cells themselves remaining undifferentiated; second, the establishment of cellular polarity; third, the establishment of the adult morphology of the cells. In the condition of no differentiation and in the first and second stages, the cells bear almost no resemblance to the adult form. Little is known of the active agents in this process of differentiation, whether it be nervous, vascular, or chemical, in so far as these are capable of separation, or whether a functional demand will evoke a stimulus to persistence and reproduction in a certain form on the principle by which Halsted has shown that a parathyroid graft will succeed where a deficiency of parathyroid secretion is present, whereas it will fail if introduced into a host with an adequate supply.[15]

What other tumours fall into this category of truly congenital and compass the ultimate destruction of the host through an early failure of his own differentiating capacity? The embryonal testicular tumours would probably furnish examples if more fully demonstrable. In the more rudimentary teratomatous groups which manifest themselves at an early age it is generally believed that the neoblastic tissue develops at the expense of other cell layers or types which had reached a slightly fuller differentiation. Ewing expresses the matter succinctly in regard to rate of growth:

"Why one teratoma grows slowly and produces adult tissues while another develops rapidly and remains embryonal in type cannot readily be explained, and this variation may possibly call for a wide difference in the stage of development of the original cell. A more obvious factor is probably found in the influence of the blastomatous process which is usually added to the embryonic growth and converts the embryo into a true tumour. Beginning early, the blastoma may completely suppress the embryo or, if late, the embryo may reach the limit of its growth before the blastoma assumes serious proportions." [16]

It should be noted that Ewing adds something, the blastomatous process, to the embryonic growth. Nicholson appears to be reasonable in regarding the differentiation as the addition or superimposition. The growth of the differentiated tissue is slowed down, according to his view, and the blastoma represents unchecked growth.

The neuro-epithelioma and medullo-blastomata which usually appear about the age of ten years are ascribed to a residual, sequestrated group of cells which have persisted in undifferentiated form during a long lag period until some systemic influence, such as the action of an internal secretion or a fractional change in the pH content of the blood, leads to more rapid growth. Certain of the thyroid carcinomata and the hypernephroma group may be predetermined by a persistent undifferentiated deposit. One other group which must be included is the nævus cell carcinoma. In this melanoma the capacity for survival of an epithelial, or at least, in P. Masson's view, an ectodermal, cell in a connective tissue medium is a characteristic of the cell from the outset. It may wait for a long period before some form of trauma or chemical stimulus initiates the rapid proliferation of the frank carcinoma. Dawson believed that the fibrosis of the corium is the effective restraining agent throughout.[17]

It will be obvious that this Continuing group complies with the conception of Durante and Cohnheim of embryonal cell rests. Their views remain of value, although the extension of them to include all manifestations of the cancer process now receives very little support.

CONVERSION.

The Conversion group must be regarded as the most important. The Implantation group demands a place in a logical examination but the human examples are negligible in number. The Continuing group is larger but their nature practically precludes the possibility of experimental study, except upon the lines of genetics. Our hopes lie in a fuller understanding of the Conversion group, and our reasonable expectation is that, with increasing knowledge, measures of prevention may reduce their incidence, as it has already done in some of the occupational examples of this type.

In the Conversion group the differentiated cell, or the germinal layer which is the less differentiated immediate antecedent of the fully adult type, is influenced by some change in environment to forsake its previous habit and morphology and to transmit

the new characters through successive generations. From the standpoint of the host the process may rightly be regarded as a perversion. We desire, however, to maintain the physiology of the cell as the fundamental consideration, and we must assume that the modifications which occur are the inescapable results for a given cell of the influences which act upon it and so determine its conversion. The independence of the altered group of cells and their worthlessness to the general metabolism of the host are evidenced by the fact that their growth may reach its most exuberant stage when the host is reduced to the extreme of inanition.

General Factors in Conversion.

While it is desirable that the problem of cellular conversion should be regarded as a search for local influences, it should be stated that certain general factors are of importance in determining the degree of readiness by which the local changes are induced.

Heredity, in its racial and familial aspects, has an influence. The work of monumental patience and accuracy of Maud Slye would in itself confirm this view. It is evident that the same change in local environment may ultimately produce in one individual a carcinoma, whereas in others the result will not proceed beyond a local hyperplasia or papillomatosis. This is exemplified in the experimental application of carcinogenic substances such as gas-works tar. With a known tar and similar strains of mice the percentage of results can be estimated with considerable accuracy. It has been demonstrated that this varying degree of resistance is alterable by such factors as the presence or pre-existence of another carcinoma in the host. It happens also that the establishment of a carcinoma has the effect of raising the immunity of the host to such a degree that epithelial modifications which may be progressing towards malignancy are rapidly halted and may be cast off. The careful work of C. E. Dukes on the disappearance of all or a number of papillomata in the bowel and elsewhere is now fully confirmed. I have seen a similar change on the ears of this rabbit. On the establishment of a frank carcinoma at the edge of one ear a fairly rapid reduction in the number of the multiple keratinised papillomata took place before the animal succumbed.

The environmental factors to which the capacity of carcinogenesis has been ascribed are of such number and variety that it would not be profitable to attempt to enumerate them. Before proceeding to analyse the process of a chronic or constant mild irritation which is the line upon which my thread is laid, I shall only refer to the views of a *parasitic cause*. These may be divided into three classes. Sambon and, in a different sense, Fibiger have stressed the importance of a gross parasite. Sambon's observations, especially in comparative pathology, are of interest but have failed to carry conviction. The brilliant work of Fibiger will be referred to later in what I believe to be its appropriate place. In the second class, which has secured, in the past, the adherence of some of the greatest names in medical history, a micro-organism, usually of the coccal group, is credited with the power of inducing cancer. In the third class, in which the scientific researches of Gye appeared a few years ago to have attained success, a non-specific filter-passing virus was supposed to act in conjunction with a specific factor of chemical nature in promoting cellular change. One can only regret that Gye's brilliant conception of the process has not been substantiated, because along that line lay the most reasonable hope of establishing a cure for the disease in full dissemination.

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(*To be continued.*)

THE BRONCHOSCOPE IN THE DIAGNOSIS OF PULMONARY DISEASE.

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ACCURACY in diagnosis must always be the primary aim of any physician; for without a correct and limited diagnosis treatment cannot be scientifically applied.

The physician especially interested in diseases of the chest can often arrive at an accurate diagnosis quite speedily: by taking a careful clinical history; by making a complete examination of the organs of the thorax with his eyes, hands, and ears; by examination of sputum macroscopically, microscopically, and culturally; and by the intuitive process which comes mainly from the mental picture formed of a disease after seeing a large number of cases. Only at this stage, and with the knowledge gained before him, should the interpretation of the shadows shown by the skiagram be undertaken. Yet in a certain proportion of cases, although the possibilities in the differential diagnosis have been reduced in number by these examinations, there is still some doubt as to the disease present, and a definite diagnosis may be of vital importance to the patient in point of view of treatment.

The same impasse, after clinical and radiological examination has been completed, is met with in diseases of other systems. In the intestinal and urogenital tracts a more accurate diagnosis can often be arrived at by *visual* investigation, the sigmoidoscope, gastric camera, gastroscope, and cystoscope serving for these purposes; moreover there can be little doubt that it is more satisfactory to *see* the lesion than to postulate one by a process of elimination and deduction. Though the above-mentioned instruments have been used in their respective spheres for many years, the bronchoscope, which was invented by Killian in 1898 and improved upon by Brünings

in 1908, nearly twenty-five years ago, has been extremely little used in the diagnosis of disease of the respiratory tract. In this respect we have been considerably behind the Americans, who for several years have been describing it as a valuable adjunct in pulmonary diagnosis and treatment. This failure to use an instrument of so great value may have been due to the fact that up till recent years it has been in the hands of the laryngologist, whose modesty has prevented him from advancing into the realms of the chest physician; whilst the latter, on his side, has been too shy to suggest that he might be surgeon enough to examine the lungs of his patients.

We ourselves, having for some years been distressed at the general inadequacy in this respect, considered it advisable to acquire the training necessary for the safe use of this instrument in our work. Those of our patients in whom diagnosis was in doubt, after thorough investigation by other means, have been examined bronchoscopically, and form the smaller part of a series of 450 bronchoscopies carried out at our clinic last year. The object of this paper is to place on record the results of these investigations, and the conclusions formed therefrom.

In carrying out these investigations we have used a specially constructed bronchoscope with a telescopic attachment, which gives a forward illumination almost equal to that obtained in the Haslinger instrument. It has been constructed for us by Mr. Schranz of the Genito-Urinary Company and a full description will be published shortly after final improvements have been made.

PULMONARY NEOPLASM.

A series of 25 cases were examined in this connexion and 21 of them were neoplastic. Bronchial carcinoma appears at the present time to be the most common form of pulmonary neoplasm. The presumptive diagnosis of this disease in the moderately advanced stage is usually not difficult on consideration of the history, clinical signs, and radiological examination; but the assumption of malignancy cannot be *proved* until the disease has advanced to such a degree that secondary glands are available for section or metastatic deposits have occurred. In the moderately advanced stage of the disease examination with the bronchoscope will usually show lesions which are beyond doubt, and allow of the removal of pieces of growth for section.

G. D., a man aged 50, was admitted twelve months ago with a hæmoptysis. He had a scoliosis, with a boss which masked the X ray examination, which suggested fibrosis. Bronchoscopic examination showed a growth of the left bronchus and section showed this to be carcinoma. He had X ray therapy, and has recently died.

On the other hand, the bronchoscope may show that the lesion suspected as malignant is not so.

A. Y., a woman aged 60, had a breast removed for carcinoma seven years previously, and was sent to hospital with the diagnosis of secondary malignant disease on that side. The clinical signs were those of extensive fibrosis on that side, and the bronchoscope showed fibrosis only, with no evidence of malignancy.

J. D., male aged 45. The X ray diagnosis was neoplasm of the right root. He had a strongly positive Wassermann reaction, and bronchoscopy showed a fibrotic condition only, without evidence of malignancy.

If any successful treatment by surgery, radium, or X ray therapy can be evolved for the treatment of bronchial carcinoma, its success will depend on the earliest possible diagnosis; therefore one must be prepared to investigate with the bronchoscope all patients presenting any of the recognised early symptoms of the disease. One of the early symptoms may be hæmoptysis.

H. D., male aged 57. Three months before admission he was seen by a tuberculosis officer for hæmoptysis. Physical and radiological examinations were negative at this time. When seen as an out-patient he had definite signs at the right base, and bronchoscopy revealed a new growth which would probably have been equally obvious at the time of the initial hæmorrhage.

Another fairly early manifestation is collapse of a portion of lung distal to a bronchus occluded by growth. The accompanying signs and symptoms are probably the commonest early manifestation. They are generally an acute onset of pyrexia, pain, and cough, and are usually mistaken for pneumonia. After a somewhat prolonged course of four to five weeks, the symptoms abate and the patient feels better; nevertheless, the cough and physical signs persist.

H. N., male aged 44. Eight weeks before he came under our care he was admitted to a general hospital as pneumonia. After six weeks his condition improved, he became afebrile, and was discharged. Two weeks later he attended as an out-patient, when signs of collapse at the right base were confirmed by radiography. Bronchoscopic examination showed a carcinoma of the bronchus, which was confirmed by section.

L. G., male aged 50. Eight months before admission had "influenzal" pneumonia, and was treated at home for six weeks. Has had chronic cough and has never been well since. On admission he showed collapse at the right base, confirmed by radiography. Bronchoscopic examination showed carcinoma of the bronchus, and this was confirmed by section.

In both these cases bronchoscopic examination at the time of the "pneumonia" would have rendered diagnosis possible.

If the blockage in the bronchus is only partial, suppuration commonly occurs behind the obstruction, and the signs and symptoms are thus identical with those of lung abscess, and diagnosis can only be made by bronchoscopic examination.

W. N., male aged 55. On admission he had cough, pyrexia, and a small amount of purulent sputum. There were signs of consolidation and collapse of the right upper lobe. The skiagram suggested collapse, and showed no definite evidence of new growth. Bronchoscopy showed a new growth occluding the right upper lobe bronchus.

Less common are those cases presenting signs of pulmonary fibrosis, with or without bronchiectasis, and which have a prolonged course, often two or three years.

L. D., male aged 58, attended the out-patient department for two years with signs of pulmonary fibrosis at the left base with marked clubbing of fingers. During the two years there was no change in his condition, and a skiagram confirmed the presence of fibrosis. The patient was admitted for further investigation. Bronchoscopic examination showed a growth in the main stem bronchus just before the middle lobe bronchus, which was confirmed by section.

We wish to lay stress on the difficulty in getting these patients in the early stage of the growth. The patient in the earliest stages is perfectly well; hæmoptysis is not a *very* early symptom, and implies that the growth has ulcerated, and that it is highly probable that there is extension into the lung. Collapse also does not take place until the growth fills, or nearly fills, the bronchus. X rays show nothing until the lung has collapsed, and, even combined with lipiodol examination, will show nothing in the early stages before a considerable amount of occlusion has occurred.

It is essential that these cases be suspected earlier, at a stage when the growth is little more than a "wart" in the bronchus. Any middle-aged person, who has not been subject to coughs, and who develops a chronic cough, should be asked particularly if he feels any sensation of sticky mucus constantly in one place in the bronchus, if he has had any wheeze

or rhonchus in one spot in the lung, which can be confirmed by stethoscope if present. If there is any constancy bronchoscopy is indicated. It is a procedure, which, in skilled hands, is devoid of risk and is no more unpleasant to the patient than a tooth extraction under local anæsthesia. By this means only will it be possible to get the disease in that stage when it is amenable to treatment by radium.

We have recently had a case in whom a growth had infiltrated from the bronchus to the extent only of a small walnut, and yet a secondary was present in the adrenal the size of a small orange.

PULMONARY SUPPURATION.

The diagnosis of pulmonary suppuration in its wider sense can usually be made on the history, physical examination, and the presence of purulent and often foul sputum. In the differential diagnosis of the cause and type of suppuration (e.g., pneumonitis, lung abscess, bronchiectasis, new growth or foreign body) bronchoscopy is of the greatest value, and we, with others, believe it to be an essential investigation in these cases. The following synopses of case reports serve to bring out various points showing the value of bronchoscopic investigations in this class of case.

G. G., male aged 46. Sent from India for treatment of cough and foul sputum from which he had suffered for years. Physical examination revealed bronchitic signs, least marked at bases, and clubbed fingers. Skiagram nil. Lipiodol: widening of trachea. Sputum 12 oz. Bronchoscopy shows large bronchi generally and uniformally dilated, mucous membrane greyish and weeping pus. No evidence of bronchiectasis or abscess. The patient died later of pyæmia and autopsy confirmed findings. The case was one of purulent bronchitis.

C. G., male aged 16. Four months' swinging temperature, pain in right chest, cough and trace of sputum. Physical examination revealed consolidation at right base and clubbed fingers. Lipiodol was no help. We were asked by our colleague, Dr. Goodman Levy, to examine the boy with the bronchoscope. This examination showed that the external division of the right lower lobe bronchus was inflamed; it was dilated, a drainage tube passed and 2 oz. of thick pus was evacuated. A broncho-pneumogram confirmed the presence of an abscess cavity. The temperature fell, and after a few more treatments the patient was cured, and remains well.

In this case, for four months the diagnosis had been at fault owing to the fact that the bronchus of drainage was occluded. It is unusual for the diagnosis of pulmonary suppuration to remain so long in doubt.

J. R., a woman aged 35, after tonsillectomy developed a cough and fœtid sputum. She was seen by a chest physician, who diagnosed an abscess of the right lung. No special treatment was carried out, and for a year the patient went steadily downhill, with great loss of weight, sputum becoming more foul and more copious. Several skiagrams showed no definite lesion. Lipiodol revealed no abscess cavity. Bronchoscope showed pus coming from the bronchus supplying the upper part of the left lower lobe. Bronchopneumogram showed the abscess cavity. On bronchoscopic drainage the patient is now well.

In this case there was no doubt as to the suppuration, but the exact nature of the lesion was not known until bronchoscopy was carried out, with the result that for a whole year the patient got steadily worse. Another point is brought out in connexion with this patient, and that is the value of defining the exact locality of an abscess by means of lipiodol placed down the bronchus of drainage under direct observation with the bronchoscope. In the ordinary case a much better lipiodol picture of the bronchial tree is obtained by the usual method of injection—e.g., crico-thyroid route, the oral method or the nasal catheter method, which last has incidentally been in use for several years on the continent. On the other hand, in a lung abscess the lipiodol given by these methods fails to enter the abscess cavity, either because the bronchus of drainage is obstructed by turgescent mucous membrane or because the cavity is full of pus.

By means of the bronchoscope the bronchus of drainage is dilated, the pus aspirated, and the cavity delineated with lipiodol.

The exact localisation is of the greatest importance if the abscess subsequently requires treatment by surgical interference. Chevalier Jackson has for years maintained that all cases of pulmonary suppuration should be bronchoscoped because he believed that a large number were due to foreign body. This may be a common cause in America, but we have not found it so in this country.

M. G., female aged 47. Tooth extraction four months before investigation. Pyrexia, cough, and purulent sputum, with clubbed fingers, and signs of consolidation at right axilla. Skiagram confirmed consolidation. Bronchoscopy showed right middle lobe inflamed and pus pouring out. Aspiration was followed by coughing up a piece of tooth. Healed by bronchoscopic treatment.

A. H., female aged 49. Hæmoptysis, cough and pyrexia four weeks. Sputum offensive two weeks. Physical signs: mitral stenosis and consolidation of right base behind. X rays showed indefinite shadow at right base. Sputum was bile-stained. Diagnosis was liver abscess ruptured into bronchus. On bronchoscopic examination hydatid daughter cysts were found in the bronchi. Cure of hydatid.

As we have previously pointed out in this paper, when a new growth has occluded a bronchus, and produced pulmonary suppuration, a diagnosis is made of suppuration, and the underlying neoplasm is missed. The only method of determining the true nature of the lesion is bronchoscopy.

In general the differentiation between lung abscess and bronchiectasis can be made on history, physical signs, and lipiodol examination. None the less in the investigation of a case of bronchiectasis the bronchoscope is of value. In the first place a new growth of foreign body can be excluded as the cause, and further the number of lobes involved can be ascertained as may the extent of dilatation of the main bronchus.

There is a type of bronchiectasis occurring in children and young adults in whom, whilst the physical signs are extensive, the sputum is small in amount or absent. The skiagram shows a cystic type of bronchiectasis. Bronchoscopy shows normal-sized main bronchi, whose mucous membrane is smooth and healthy, and, branching from the bronchi, numerous smaller bronchi not usually seen. This type we have suspected as being of congenital origin, allied to the cystic lung.

M. K., a thin pale girl aged 11, who has always led a normal life. The school doctor found signs in the chest and sent her to the tuberculosis officer, who transferred her to us. Slight cough, little sputum (not foul), and fibrotic signs over the whole of the left chest. Skiagram, with lipiodol, showed a cystic like condition. Bronchoscopy shows the main stem bronchi healthy, many small adventitious bronchi arising from the main stem. Artificial pneumothorax and thoracoscopy confirmed the evidence in favour of congenital origin.

In some cases of pulmonary suppuration, by obtaining the pus direct from the depth of the abscess, a pure specimen may be obtained for microscopical and bacteriological examination; spirochætes or other organisms not found in the sputum may be found, and intravenous novarsenobillon be given or a vaccine prepared, as the case may be.

Although the bronchoscope is of value in the diagnosis and localisation of pulmonary suppuration,

its principal use in this disease is in the treatment of it. It is not our intention in this paper to discuss its use as a therapeutic method, for we propose to deal with this aspect later.

OTHER DISEASES.

A not uncommon diagnostic problem arises in cases of hæmoptysis when clinical and radiographic examination give no evidence of disease. In the young patient tuberculosis is suspected, and in the middle-aged or older neoplasm. A lipiodol examination, as we have reported previously, may show an unsuspected dry hæmorrhagic bronchiectasis, and should therefore always be done. A bronchoscopic examination should also be made before resting content with an uncertain diagnosis.

As previously stated, an early carcinoma may be found, whilst in young patients a swab taken from the bronchial mucous membrane and examined for tubercle bacilli may give a positive finding which would not otherwise have been obtained. Some ulceration or a vascular area may be seen from which the hæmorrhage has arisen, as the following case illustrates.

T. P., male aged 20. For three years repeated hæmoptyses. General condition excellent. Physical signs and skiagram negative. Lipiodol negative. Bronchoscopy shows a crescentic vascular septum opposite the right middle lobe bronchus. This was cauterised with silver nitrate. There has been no further bleeding during the last nine months.

As an example of the value of a swab.

A. M., female aged 21. Cough and wasting some months. Physical signs of infiltration at left base. Skiagram shows a shadow in this region. No sputum. Fæces negative for T.B. several times. Bronchial swab T.B. present.

A neoplasm involving the upper lobe bronchus not uncommonly activates an old tuberculous lesion, T.B. are found in the sputum, and the diagnosis is confirmed. We have had several cases of this type before doing our own bronchoscopy. Bronchoscopy allows of the diagnosis being cleared.

We have found the examination of value in many other cases which do not come in the above group. The following are examples :—

G. B., male aged 50. Cough, pain, and dyspnœa. Physical examination suggested dilated aorta. Radiography confirmed and showed a lesion of the right root, indefinite in diagnosis. Wassermann reaction positive. Bronchoscope showed mucous membrane of the right bronchus and divisions pallid. Plaster-of-Paris appearance very suggestive of specific infiltration and fibrosis.

G. F., male aged 56, showed all the signs of mediastinal tumour. Radiological examination could not exclude aneurysm. Wassermann reaction negative. Bronchoscopy showed bronchial carcinoma.

CONCLUSION.

In our opinion bronchoscopic examination is a very valuable additional method in the investigation of pulmonary disease. In some groups, neoplasm and suppurative condition, it is essential. It is a method which does not disturb the patient unduly, and in experienced hands is quite safe. In some 450 bronchoscopies performed under local anæsthesia (more than one-third of which have been done on out-patients, who have gone home two to three hours after the operation) we have never seen any ill-effects and not had a complaint from a patient. In those patients who come regularly for treatment in suppurative conditions the reverse is the case; their readiness to submit to repeated drainage raised our suspicion that the cocaine spray was the attraction, but the substitution of percaine for cocaine failed to diminish their desire for treatment.

EFFECT OF BRAIN DIET IN SUBACUTE COMBINED DEGENERATION OF THE CORD.*

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THE reasons which led to the trial of brain diet have been described in a previous communication,[1] in which the potency of brain for blood regeneration in pernicious anæmia, as measured by the increase of reticulocytes and red blood-cells in four cases, was shown to be about one-third that of liver. The present paper describes an attempt to estimate the potency of brain relative to that of liver, with regard to their respective effects upon the neurological symptoms of pernicious anæmia. It was decided to use, whenever possible, patients whose neurological condition had failed to improve on liver pulp derived from 240 to 480 g. of raw liver daily, or on similar amounts of cooked liver. In a large series of cases of subacute combined degeneration of the cord at the Massachusetts General Hospital,[2] the Boston City Hospital, and the Royal Victoria Infirmary, Newcastle-upon-Tyne,[3] it was possible to find only a relatively small number of such instances. Of the nine cases described here, seven were of this type.

Method.—The brains of freshly killed oxen were used whenever obtainable. At other times frozen brain was used. After cleaning and passing through a meat grinder, 480 g. of the ground material were administered daily in three or four divided doses in the form of a purée with orange juice. This mixture makes a drink of more or less fluid consistency, which is taken usually without difficulty. The patients were confined to bed as little as possible, and, although they were encouraged to walk, no re-educational exercises were instituted.

CASE RECORDS.

Nine cases have been treated with whole brain for from two to six months. Six improved and three cases failed to show improvement.

CASE 1.—A man, aged 50, had subacute combined degeneration of the cord, with signs of gross involvement of posterior and lateral columns. Neurological symptoms were of fourteen months' duration. Symptoms referable to anæmia had been present for three months before the neurological manifestations commenced. At first liver therapy had been irregular and inadequate. For the last five weeks, however, he had taken daily "domestic" extract [4] derived from 240 g. of liver, and for eight weeks before that commercial extracts derived from approximately 600 g. of liver together with 240 g. of raw liver pulp. His general condition greatly improved with disappearance of the anæmia, but without as yet any improvement in the neurological symptoms.

At the *commencement of brain diet* he was unable to stand alone, and required the help of two persons to walk even a few steps. He was unable to dress or undress himself or to write. Numbness and tingling involved the extremities, reaching to the elbows and to the knees. Red blood-cells numbered 4·53 millions per c.mm. The upper limbs showed diminished power with hyper-active deep reflexes, and Wartenberg's thumb sign [5] was positive bilaterally. Gross astereognosis was present with inability to recognise any except large objects. There was considerable loss of power in the lower limbs, with gross incoördination, absence of joint-position sense in the toes, and absence of vibration sense (C,128) below the knees. The knee- and ankle-jerks

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were exaggerated, and the plantar reflexes extensor in type. He was instructed to discontinue liver and to take one pound (480 g.) of fresh raw ox brain with orange juice, daily.

After five weeks the red cell count was 4·4 millions per c.mm. He was now able to stand alone and to walk without help, occasionally steadying himself by holding on to objects as he passed them. He could undress without aid, though he still needed help to dress. Paræsthesiæ had diminished greatly in degree, and no longer interfered with sleep. The level of numbness had decreased to the wrist and ankle. Stereognosis had greatly improved, so that he could recognise any test object. There was an increase in the power of the upper and lower limbs, and coördination of the legs had considerably improved.

After fourteen weeks the red cell level was 4·2 millions per c.mm. He could now walk alone without holding objects to steady himself, and could run for a short way with help. Except for assistance with very small buttons he was able to dress himself, and he recommenced to shave himself, using a "straight" razor. There was greater strength in the limbs, and coördination of the legs was only slightly impaired. There was slight improvement in joint sense, but no return of vibration sense, nor any change in the plantar reflexes. He continued to improve, so that he was able to climb stairs without difficulty. Six months from the commencement of brain diet he suffered a gastro-intestinal upset in which nausea and vomiting occurred with a feeling of general weakness. Two weeks later the red cell count had fallen to 3·5 millions per c.mm. and paræsthesiæ increased, but there was no increase in incoördination. Liver therapy was temporarily substituted to combat the anæmia. A few days later the feeling of weakness had practically disappeared, and it was clear that the neurological improvement which had developed during the period of brain treatment had not been seriously affected by the relapse of the anæmia.

The neurological improvement in this case was rapid and occurred in spite of a gradually falling red blood-cell count.

CASE 2.—A farm hand, aged 39, entered the hospital with subacute combined degeneration of the cord of two years' duration. For seventeen months he had taken about 960 g. of cooked liver a week, with liver extract No. 343 (N.N.R.) derived from 300 g. of liver daily. For the past six weeks he had been given from 480 to 700 g. by weight of raw liver daily while in hospital. Symptoms referable to anæmia had disappeared, and his general condition was excellent, but the neurological symptoms had become worse even during the last six weeks.

At the *commencement of brain diet* the red blood-cells numbered 4·2 millions per c.mm. He was unable to stand or to walk even with the assistance of two persons. Memory was somewhat impaired, and his vision was defective. He was troubled with urgency of micturition. Numbness and tingling were present in the finger-tips, and in the legs up to the calf. The cranial nerves showed no evidence of abnormality except for slight nystagmoid movements. The upper limbs showed slight incoördination and diminished vibration sense; the deep reflexes were increased, with positive Hoffmann's and Wartenberg's reflexes on the right side. There was marked loss of power in the lower limbs with gross incoördination on the heel-knee test and almost complete loss of sense of position. Joint sense was absent in the great toes and vibration sense (C,128) absent below the twelfth dorsal vertebra. The knee- and ankle-jerks were absent and the plantar reflexes showed an "extensor" response on stimulation of either the inner or the outer sides of the sole; Oppenheim's sign was positive. The basal metabolic rate was minus 13 per cent.

Liver treatment was discontinued, and 480 g. by weight of raw ox brain pulp were administered daily.

After seven weeks the red cell count was 4·98 millions per c.mm. He was now able to get out of bed alone, and stand upright by steadying himself slightly. He could walk about the ward easily with two hands resting on a chair. Memory had greatly improved and his handwriting was better. Visual acuity had increased so much that he was now able to read a newspaper easily. The urgency of micturition had ceased, and numbness and tingling had disappeared from the legs. The lower limbs showed an increase in power, with much improved coördination. Reflexes were unchanged and joint sense only slightly improved, but there was a partial return of vibration sense in the toes, tibiæ, and ilia. He has continued to improve at home, and now after four months of brain diet, about 480 g. a day, he walks alone on crutches.

Noteworthy is the rapidity of the neurological improvement, affecting memory, vision, sphincter control and vibration sense in addition to gait, coördination, and paræsthesiæ.

CASE 3.—A plasterer, aged 56, entered the hospital with subacute combined degeneration of six years' duration. Symptoms referable to anæmia began two years before entry. For the past six months he had taken, regularly, about 480 g. of raw liver daily. His general condition and anæmia had improved markedly, but the neurological condition had progressed unfavourably.

At the *commencement of brain diet* red cells numbered 4·0 millions per c.mm. He could not stand, and needed the assistance of two persons to walk even a short distance. Numbness and tingling involved the fingers and palm of the hand, and the legs up to the waist. There was a central scotoma in each visual field, possibly attributable to tobacco. Micturition was difficult at times, with urgency. Examination of the upper limbs showed some loss of power, impaired coördination, absent vibration sense in the hands and at the wrist, grossly defective joint sense in the fingers and very marked impairment of stereognosis. The deep reflexes were exaggerated with positive paradoxical flexor-extensor response. The lower limbs showed loss of power with increased tone, gross incoördination, loss of joint sense in the toes, complete loss of vibration sense below the waist, and impairment of skin sensibility to pin-prick or light touch below the knees. The knee- and ankle-jerks were exaggerated, with patellar and ankle-clonus, and the plantar reflexes were "extensor" in type on stimulation of either outer or inner sides of the soles of the feet; Oppenheim's sign was positive on the right side. The basal metabolic rate was minus 19 per cent.

Raw ox brain, 480 g. in orange juice, was given daily and liver therapy discontinued.

After four weeks the red cell count had diminished gradually to 3·6 millions per c.mm. Power and coördination of the legs were much improved. He was able to stand alone for short periods, and to walk well with a chair. Numbness and tingling had decreased in intensity and in extent, now reaching only as high as the knees.

After eight weeks the red cell count had fallen to 3·2 millions per c.mm., but he continued to improve neurologically. Strength and coördination of the limbs were increased, visual acuity was greater, and stereognosis had improved. There was a return of vibration sense in the hands but not in the legs, and some return of joint sense in the fingers. The legs were less spastic, deep reflexes were less active, and Oppenheim's sign was negative.

After ten weeks, however, he had a relapse following an upper respiratory infection in which the red blood-cell count fell to 2·8 millions per c.mm. and in which the neurological symptoms also increased. Finally brain treatment was abandoned in favour of liver extract parenterally.[6 7] He has received intravenously, over a period of seventeen weeks, extract derived from a total amount of 2110 g. of liver, and subsequently, by the intramuscular route during a period of four weeks, extract derived from 250 g. of liver. The red blood-cell count reached 4·9 millions per c.mm. after seven weeks, during which time there was considerable decrease in extent and degree of paræsthesiæ. In spite of this somewhat intensive course of liver treatment, although there was considerable gain in strength and improvement in general health, which enabled him to walk more readily with a walking chair, neurological signs remain unchanged and he is still unable to stand alone.

This case showed remarkable neurological improvement with brain diet, although the symptoms had progressed while taking similar amounts of whole liver. The improvement took place in spite of the fact that the red blood-cell count was falling. The relapse which subsequently occurred, affecting both the blood and neurological symptoms, appeared to be due to the upper respiratory infection. The subsequent administration of liver extract parenterally brought about improvement in the blood and in the general condition, but apart from a decrease in paræsthesiæ, there have not been, as yet, any signs of neurological improvement since the relapse.

CASE 4.—A pedlar, aged 69, male, first had symptoms referable to anæmia three years previously, with neurological symptoms for the past two years. Liver treatment was begun at the time of onset of the anæmia, but had at first been irregular. For the past seven months, however, he had taken about 480 g. of raw liver daily, missing never more than one or two days per month. Although his general condition was excellent, and the anæmia had disappeared, the neurological symptoms had become severe.

At the *commencement of brain diet* the red cell count was 4·8 millions per c.mm. The basal metabolic rate was minus 9 per cent. and his weight was 227 pounds. He was unable to stand unaided, and required assistance to walk even a few steps and to get in and out of bed. Micturition was difficult, with urgency at times. Numbness and tingling

were marked in degree, and involved the legs up to the waist, and each arm to a level well above the elbows. There was marked pyorrhœa. The radial arteries were grossly thickened, calcified, and tortuous. The cranial nerves were normal except for slight nystagmoid movements. The upper limbs showed increased deep reflexes with positive Hoffmann, Wartenberg's, and "paradoxical flexor-extensor" reflexes on the right side. In the lower limbs there was some loss of power, and marked incoördination; joint sense was lost in the toes and ankles, and vibration sense was absent up to the hips. The knee- and ankle-jerks were exaggerated and the plantar reflexes were "extensor" in type on stimulation of either outer or inner sides of the feet. Liver therapy was discontinued, and 480 g. of raw ox brain was given daily.

At the *end of six weeks* the red cell count was 4·5 millions per c.mm. He was able to walk well, resting his hands on an arm-chair which he pushed before him. Numbness and tingling had diminished to the level of the wrists, and to the knees.

At the *end of eight weeks* he was able to walk with a stick, and even to manage a few steps without it.

At the *end of ten weeks* the red blood-cells numbered 3·7 millions per c.mm. He was now able to walk alone across the ward without using the stick. Coördination of the legs was very much improved, and there was some return of joint sense in the toes. Spasticity was less, and the deep reflexes less active. Some loss of weight had occurred, but not enough in itself to account for the improved gait.

Extract No. 343 (N.N.R.) derived from 400 g. of liver was now given daily in addition to the brain, but, in spite of this, the red cell count diminished further to 2·8 millions although the neurological improvement was maintained. At this point brain diet was discontinued and liver extract No. 343 (N.N.R.) derived from 1000 g. of liver was substituted. The red cells slowly increased to 3·4 millions per c.mm. in a period of thirty days, at the end of which time resource was had to liver therapy by the intramuscular route.[7] The daily injection of liver extract derived from 10 g. of liver for thirty-two days was accompanied by a further slight increase of red blood cells to 3·85 millions per c.mm., and there was some further increase in strength.

This case showed rapid neurological improvement on brain after failing to respond to similar quantities of liver. It is interesting, moreover, that the improvement took place despite the falling red blood-cell count. The slowness of the subsequent hæmopoietic response to liver extract by mouth and also parenterally seems to indicate that this patient was to a considerable extent "refractory," and it can be readily understood why the red blood-cell count fell during the period of administration of brain. The work of Beebe and Lewis[8] suggests that larger amounts of potent material are required to maintain the red blood-cell level in elderly than in young patients, especially if arterio-sclerosis is present.

The following two cases showed slighter degrees of improvement.

CASE 5.—A widow, aged 59, had shown only slight improvement in gait, and no improvement in paræsthesiæ during treatment with 240 g. of raw liver daily for a year, and with varying amounts of liver and liver extract before that. Ox brain, 480 g. was given daily together with liver extract No. 343 (N.N.R.) derived from 100 g. of liver, which was added in an endeavour to prevent a relapse of the anæmia.

At the commencement of brain treatment numbness and tingling were particularly marked. Moreover, light touch in the distribution of the paræsthesiæ evoked such intense and widespread pain that thalamic involvement was suspected. After seven weeks the numbness and tingling had decreased very markedly, the hyperæsthesia of the hands is no longer evident, and there has been slight further improvement in her ability to walk. During this time the red cell count fell gradually from 4·9 to 4·25 millions per c.mm.

CASE 6.—A coal-miner, aged 59, had shown little or no neurological improvement with about 1400 g. of cooked liver per week for a year. While taking 240 g. of cooked brain daily (i.e., three and one-half pounds a week) there was almost complete cessation of flexor spasms of the legs, which, accompanied by arching of the spine, had caused him considerable discomfort. Paræsthesiæ improved in degree but not in extent, and his ability to walk was somewhat increased.

In three cases (Nos. 7, 8, and 9) the administration of 480 g. of raw ox brain daily produced no neurological benefit in a period of four months.

CASE 7 was a married woman, aged 60, whose neurological symptoms had previously failed to respond over several years to relatively small amounts of liver and liver extract, including 240 g. of raw liver daily for five months.

CASE 8.—A man, aged 63, was an advanced bedridden case with complete paraplegia in flexion and incontinence of urine, together with bed sores and urinary infection. He became worse, even though for four months liver extract derived from 600 g. of liver was given daily in addition to the brain.

CASE 9.—A man, aged 46, had relatively slight neurological involvement but failed to benefit from brain diet even when combined with liver extract derived from 400 g. of liver and with thyroid medication.

ANALYSIS OF THE EFFECTS OF BRAIN DIET IN THE SIX IMPROVED CASES.

Five of these cases received daily 480 g. of raw ox brain, and the other received 240 g. of cooked brain. Case 5, noted above as having shown improvement of lesser degree, received daily, in addition to the brain, liver extract No. 343 (N.N.R.) derived from 100 g. of liver. With this exception, the neurological improvement occurred while brain diet alone was taken.

Of the six cases, four showed marked improvement, and in two the improvement was slight. The four which improved most were advanced cases which had previously failed to respond to from 240 to 700 g. of liver daily, the average daily amount being about 440 g. In two of them the liver dosage had been as much as 480 g. daily for six and seven months respectively.

Nervous System.—With brain diet four of the six cases showed distinct neurological improvement which was manifest within eight weeks. Formerly bedridden, they regained their ability to stand alone, and two became able to walk unaided; the other two could walk with the assistance of crutches or by holding furniture. Incoördination and ataxia greatly improved, and numbness and tingling decreased in extent and in intensity. Astereognosis, present in two cases, showed striking improvement in one instance and moderate improvement in the other. Vision improved in two instances and in one case there was, in addition, a notable improvement in memory. Sphincter disturbances, comprising difficulty and urgency of micturition, which were present in three cases, cleared up completely in one patient, and improved in another. The deep reflexes of the lower limbs, which had been exaggerated in two cases, became less active, coincident with a decrease in spasticity. The "extensor" plantar reflexes showed no significant alteration. Vibration sense (C, 128) returned in the lower extremities in one instance; in another patient, vibration sense returned to the bones of the hand and forearm although remaining absent in the legs. The latter case showed, in addition, a return of joint sense in the fingers. Three other cases showed some return of joint sense in the toes. One of the markedly improved cases subsequently relapsed following an upper respiratory infection, both the blood and the neurological symptoms being affected.

The improvement of lesser degree which occurred in two of the six cases has been described.

The Blood.—During the period of brain diet, and coincident with neurological improvement, the red cell count gradually diminished in four instances as follows: from 4·4 to 4·2, 4·0 to 3·2, 4·8 to 3·7, and 4·9 to 4·3 millions per c.mm. In each case it was considered desirable, after periods varying from two to six months, to add or substitute liver or liver extract in order to combat anæmia. The significance of these findings is discussed below.

DISCUSSION.

The results obtained suggest that ox brain may exert a beneficial effect upon the neurological phenomena of pernicious anæmia. It is necessary to decide how much of the improvement can be attributed to the effects of brain diet. Although Oppenheim [9] and Curschmann [10] believe that, in the absence of treatment, "natural" remission of the neurological manifestations may occasionally happen, such an event must be extremely rare, and Collier [11] states that "any improvements which occur are improvements in the general health and in the anæmia, rather than any lessening of the gravity of the nervous manifestations." Russel [12] expresses a similar opinion. It therefore seems unlikely that the neurological improvement during brain therapy could be attributed to spontaneous remission.

The question also arises as to whether the improvement which occurred in six of the nine cases during brain treatment could be attributed to an effect carried over from the previous liver therapy. In four patients (Nos. 3, 4, 5, and 6) liver treatment had been taken without significant neurological benefit for sufficient lengths of time to rule out any likelihood that, in the absence of brain diet, improvement would have commenced after liver had been discontinued. In two cases (Nos. 1 and 2), however, the periods of administration of moderate to large amounts of liver (240 to 700 g. daily) which preceded the brain treatment were relatively short—namely, 13 weeks in one case and six weeks in the other. In the longer of these periods, at least, one would expect some, although not maximal, neurological benefit. But since, during the administration of liver for these lengths of time, one patient had shown no improvement whatever, and the other had become worse, and further, since improvement promptly occurred during subsequent brain therapy, it is very improbable that the beneficial effect could be attributed to the liver previously ingested. Moreover, the fact that neurological improvement continued for six months and four months respectively, with brain diet in the absence of liver, is further evidence that this benefit is unlikely to have been a remote result of the previous liver treatment.

With regard to the three patients who did not improve, it should be pointed out that one, who was in the terminal stages of the disease, with complete paraplegia in flexion and incontinent sphincters, was also suffering from urinary sepsis and bed sores. Such complications have been shown to adversely affect the response to liver therapy of the neurological condition.[3 5] It is known that, even in the absence of septic complications, there are certain cases of subacute combined degeneration which fail to show neurological improvement when treated with large amounts of whole liver over periods of many months.[3] This lack of response may perhaps be due to defective absorption or utilisation of the active principle or to its destruction in the gastro-intestinal tract. Some such explanation possibly accounts for the lack of improvement in the other two patients, one of whom had already failed to respond to 240 g. of raw liver taken daily for five months.

In the improved cases the effect of brain appeared to be greater than that of the liver previously taken, but only in Cases 3 and 4 were the amounts of liver and brain in any way comparable weight for weight. The evidence is as yet insufficient for any accurate comparison of the relative potencies of liver and brain for producing neurological benefit.

However, if the hæmopoietic potency of ox brain is taken as about one-third that of liver, then six out of nine cases improved neurologically on a diet which was less potent for blood regeneration than that of the previously ingested liver. This is also emphasised by the fact that in all cases, except Nos. 2 and 6, the red cell count diminished during the period of neurological improvement.

If the results are confirmed, it would appear that the effect of brain diet upon the nervous system is markedly disproportionate to its effect upon the bone-marrow, when compared to the relative effects of liver upon these two systems. The findings tend to support the hypothesis that the effect of organ therapy upon the nervous system in this disease is not wholly the result of maintenance of the red blood-cell count at a high level, and that there may exist in liver and in brain a factor beneficial to the lesions in the nervous system, distinct from that which influences the regeneration of blood. Mellanby [13] has suggested that fat-soluble-A may be the factor responsible, but brain contains little or none of this vitamin.

Owing to its low potency for blood regeneration, brain is not suitable for the routine treatment of subacute combined degeneration unless combined with amounts of liver or potent substitute adequate to maintain a normal blood picture.

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TREATMENT OF SUBACUTE COMBINED DEGENERATION OF THE CORD BY MASSIVE IRON DOSAGE.

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IT has now come to be recognised that in the treatment of subacute combined degeneration of the cord liver therapy is usually of little or no use, in fact the disease often progresses in spite of its administration. Of late, various experimenters have gone into new fields of research in an attempt to find some other factor at work to produce these nervous changes. Prof. E. Mellanby,[1] for instance, has published research which inculpates vitamin A deficiency.

Several observers for many years have pointed out that in cases of subacute combined degeneration, the blood picture is rarely that of a typical pernicious

anæmia.[2] The presence of an achlorhydria has led many to suppose that the abnormal blood picture seen is but an early and immature manifestation of pernicious anæmia, and as a consequence it is often taught that the nervous changes may precede the fully formed blood picture. The introduction of liver therapy has distracted our attention from the fact that the blood picture in many cases never matures into one of typical pernicious anæmia, since it is believed that treatment with liver has prevented this. Thus what appears to be a most important pathological feature of the disease has not been sufficiently emphasised.

Since 1930 it has been shown by L. J. Witts [3] and others that achlorhydria is associated not only with primary or macrocytic anæmia, but also with secondary, chlorotic, or microcytic forms. The macrocytic anæmia, as we know, responds to liver therapy, whilst the microcytic anæmia makes good recoveries under large doses of iron. In the Medical Unit at St. Mary's Hospital this latter mode of treatment, advocated by Witts, has been employed for several months and results obtained which amply justify the claims made for it; when liver treatment has failed, several cases of microcytic anæmia with achlorhydria have made complete recoveries by the administration of large doses of Blaud's pill.

W. B. Castle [4] in a series of classical experiments has demonstrated that it is a deficiency in gastric secretion which is responsible for the changes in the blood picture in macrocytic anæmia, but at present the reason why, given a primary achlorhydria, either macro- or microcytic anæmia may develop is undecided; nor do we know what circumstances determine how the blood picture will shape.

Bearing these considerations in mind, it seemed to me just possible that in subacute combined degeneration iron might be more essential than liver in the treatment, although it was realised that iron in large dosage must have been used previous to the introduction of liver therapy, without, apparently, any marked beneficial result. It was therefore determined to apply *massive* dosage, provided that no toxic symptoms developed, and grs. 150 of Blaud's pill a day have been given without harmful effects.

Since only four cases have been treated, an estimation of its value must be of a purely tentative nature, but the excellent results achieved in three out of the four cases, and the marked improvement made by the fourth, suggest an element of truth in our hypothesis. Some difficulty has been found in trying to collect many cases of subacute combined degeneration, in which the signs were sufficiently developed to establish the diagnosis with fair certainty, but as no reference elsewhere to treatment by "massive iron" therapy has been found, the results obtained by this method seem worthy of record in order that it may be given a more extensive trial.

CASE RECORDS.

CASE 1.—A man, aged 62, sent up by his doctor on Oct. 17th with a diagnosis of cerebellar disease. Discharged from work two years ago, owing to his ataxia and danger of falling into the machines which he was working. For the last six months he had grown steadily worse, and on admission could not walk more than a few yards without stumbling or holding on to objects for support. After being in bed for two days, he could not walk without falling over. Rombergism well marked. Complained of stumbling about, giddiness, weakness of legs and arms, pins and needles in hands and feet. Some incontinence of urine. Legs drawn up involuntarily in bed at night.

Examination showed diminution of tactile sensation in many areas. Temperature sensation impaired on lower jaw and left forearm. Absence of vibration sense below right knee. Some lack of positional sense. Deep reflexes of arms and legs exaggerated, more so on the right side. Positive Babinski on left side, and doubtful on right. No ankle-clonus elicited. Complete achlorhydria present. Cerebro-spinal fluid tests were all negative; Wassermann reaction negative. Blood count on admission showed hæmoglobin, 68 per cent.; red cells, 3,330,000; colour-index, 1·0; and white cells, 9600. No polychromasia or nucleated red cells present.

Patient was treated by administration of Blaud's pill grs. 50 three times a day. He was allowed up only in the evening, and no massage or exercises were given. No liver was given in this case. Three weeks after admission he could get straight up out of bed and walk with very little ataxia. Five weeks after admission he was able to walk up and down a few stairs without holding on to the banisters. Seven weeks after admission he insisted on going home, as he said he felt quite well. Seen ten days later, when he walked up and down two flights of stairs without any visible sign of ataxia. On examination sensation was normal over the whole body, all thermal sense restored and use of hands much improved. He had lost all feelings of pins and needles in his hands, but vibration sense had not completely returned to his right leg, though he could now appreciate its presence. There was still some weakness of right arm present and exaggerated reflexes in right arm and knees. Left Babinski now flexor, but the right still doubtful. Sphincter trouble gone. Was thinking of returning to work in February. Blood count showed Hb. 70 per cent.; red cells, 4,400,000; C.I., 0·8; white cells, 6400.

Seen again after Christmas, he said he went over to party at friend's house and feels rather tired, but is still walking perfectly well.

CASE 2.—Woman, aged 36, sent up for anæmia by doctor who had been treating her with liver for some time, but without the patient making any progress. On examination on Nov. 26th she was seen to be anæmic, Rombergism was present to a marked degree, and she swayed helplessly when asked to walk along a straight line. Complete absence of vibration sense in both legs. Both knee-jerks were exaggerated, the right more so than the left. Babinski's sign absent; no ankle-clonus. This appeared to be an early case of subacute combined degeneration. Treated with Blaud's pill grs. 50 three times a day, and liver therapy which had been used by her doctor was continued. Not allowed out of bed for a fortnight and no massage given. At the end of a fortnight she was allowed up and asked to walk. Rombergism was now absent and patient could walk along a straight line. Put in bed another week; condition still more improved at the end, and could walk along a straight line placing one heel in front of preceding toe, a severe test for coördination, with ease. All signs have completely cleared up, and vibration sense is now appreciated in both legs, where before it was totally absent. Blood count has risen from Hb. 30 per cent.; red cells, 1,830,000; C.I., 1·1; white cells, 38,000; (relative lymphocytosis), to Hb. 74 per cent.; red cells, 3,270,000; C.I., 1·1; white cells, 7000. Patient is still under treatment for the anæmia. She says that all feeling of heaviness and stiffness has left her legs.

CASE 3.—Woman, aged 50, admitted to Medical Unit in June, 1931, complaining of pain in back and some tingling in fingers. She also said that she was unsteady and could not walk any distance without becoming tired. On examination the gait was found to be slightly ataxic, Rombergism was present but not marked, and vibration sense was lost in both legs. The reflexes were all normal except for exaggeration of the right knee-jerk. Complete achlorhydria present and blood count showed Hb., 39 per cent.; red cells, 4,300,000; C.I., 0·4; and white cells, 5000. Diagnosed as a case of subacute combined degeneration. Massage for legs and full liver diet were given, and patient was sent out on the liver diet, having made some improvement.

Written for on Nov. 14th to try the effect of the new treatment. She now complained that she could not walk more than a mile without her right foot turning over, and her husband said that when this occurred she became very ataxic, and he had experienced some difficulty in getting her home. She had not been able to do any housework or cook the meals. Additional signs were now present in spite of the liver treatment. The right leg gave a positive Babinski sign and both ankle-jerks could only be elicited with great difficulty; the knee-jerks were not exaggerated. Absence of vibration sense was present as high as the mid-thoracic region of the spinal column. Frequent attacks of incontinence of fæces were also occurring.

Treated with Blaud's pill grs. 50 three times a day for three weeks in the ward and since then as an out-patient. A marked improvement in general health has occurred; her husband reports that he accompanied her on a three-mile walk and no signs of ataxia or weakness of the leg developed. She has only had one attack of incontinence of fæces since returning home. Vibration sense has returned as low down as the mid-lumbar region, but it can only be very feebly

appreciated in the left knee. The right leg still gives a positive Babinski sign, but the ankle-jerks are now easily elicited. Blood picture is Hb. 80 per cent.; red cells, 4,440,000; C.I., 0·9; white cells, 5000. She has again resumed the cooking and housework for the family, and finds no disability from what physical signs she has remaining.

CASE 4.—A nurse, aged 58 years. In May, 1930, began to find difficulty in keeping her balance and doing delicate movements with her fingers. Tingling and pins and needles in her hands. Had to give up work owing to unsteadiness and weakness of the legs. Admitted under Medical Unit in April, 1931. Rombergism was marked, total loss of vibration sense in both legs, and slight weakness of tactile sensation in right leg. Abdominal reflexes lost; bilateral positive Babinski and exaggerated reflexes of legs and arms. Some slight incoördination of arm movements and loss of positional sense in toes. Blood picture showed Hb. 84 per cent.; red cells, 3,600,000; C.I., 1·1; and white cells 9100 with no relative lymphocytosis. Complete achlorhydria present. Cerebro-spinal fluid and Wassermann test revealed nothing. Treated with liver and Radiostoleum with some slight improvement. Sent out to nursing-home and from there to rest at home in Suffolk. Here she found that she could only walk with the aid of a stick and had frequent falls.

Written for to return, owing to success of previous cases, and on admission was unable to walk without continually steadying herself by holding on to articles of furniture. Immediately on leaving bed was completely ataxic.

She was treated with Blaud's pill grs. 50 three times a day, and the liver treatment was continued. No massage or any other treatment was given. Very little improvement for three weeks, then a sudden improvement took place. Can now walk round ward and negotiate obstacles placed in her path with very little ataxia, and needs no help at all. Gait still slightly spastic, but otherwise general power of walking is good even on immediately rising from bed. Pins and needles now absent, though these had not been a prominent symptom for some months. Only slight return of vibration sense in left ankle, but good sensation in right leg. Reflexes still exaggerated, but left Babinski is only doubtfully positive. Rombergism now practically absent, and positional sense of toes much better. Patient cannot yet walk up and down stairs without help, but is improving rapidly, while general health is markedly better. Blood count was Hb. 98 per cent.; red cells, 4,930,000; C.I., 1·0; white cells, 8000. Total length of treatment with iron since admission is six weeks.

It will be seen that the clinical improvement in three out of four of these patients was most unusual; in the fourth, who was not markedly ataxic, some improvement occurred in her general power of walking, return of vibration sense and loss of sphincter trouble. In all four cases, only one presented a blood count that resembled pernicious anæmia, but all four had complete achlorhydria. It seems to be essential to continue treatment without remission for at least six weeks before it can be regarded as having failed. All the patients are still taking their large doses of iron at the time of writing, and they will only be reduced when we are certain that maximal improvement has taken place. None of them are experiencing any unpleasant symptoms from the treatment.

From the nature of the pathology of the disease, it is not to be expected that all signs will clear up, for nerve tissue, once destroyed, cannot be regenerated. The chief result must necessarily coincide with the earliest period of the disease, when the morbid changes are essentially those of œdema of the medullary sheaths. It must be due to the fact that there was no actual degeneration of axis cylinders that two out of the four patients who were unable to walk without stumbling are now able to do so, that their ataxia and the other nervous features of their malady are so greatly improved. In all, the sense of well-being and general health is remarkably better.

I have to thank Prof. F. Langmead most sincerely for allowing me to carry out these investigations under his supervision and help. Dr. Wilfred Harris has also seen the cases and has advised a preliminary publication of what has been achieved. It is hoped that this will prompt others to carry out what is essentially an easy treatment, and to report on the results so that its value can be more accurately assessed. In spite of the small number of cases treated, the results appear to warrant the conclusion that the procedure may be a definite contribution to the treatment of a disease which has always provided a difficult therapeutic problem.

SUMMARY.

1. Liver therapy in subacute combined degeneration having generally failed, it was decided to seek for some other factor in its causation.

2. The fact that many cases did not present a typical primary or macrocytic type of anæmia, but rather a secondary or microcytic anæmia combined with an achlorhydria suggested the use of iron.

3. It was decided to give "massive dosage" because it was thought that iron in large doses must have been used previous to the introduction of liver therapy.

4. Blaud's pill, grs. 150 a day, was given to four patients with strikingly beneficial results. Two who were not able to walk unaided can now do so, and the other two, in whom the disease was not so advanced, have been greatly improved. No other accessory treatment, except the continuation of liver diet in three cases, has been given.

To simplify administration, Blaud's pill has been made up in powder form in capsules. The dosage is three capsules three times a day, equivalent to grs. 150, given with a little water.

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MASSIVE ENLARGEMENT OF THE BREAST.

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AMONGST the lesser ills that afflict the body, enlargement of the mamma beyond the limits of physiological necessity, to such a degree as to embarrass and distress the possessor, presents a problem of interest and of some importance.

Perhaps the condition is less common, perhaps vanity is less of a cardinal virtue in this country; certain it is that little more than a casual consideration seems to have been given to the problem here; and it is necessary to turn to the literature of America, France, Germany, and Italy to find any serious treatises on the subject. This lack of interest, as reflected in our literature, probably arises not so much from any rarity of the disease, as from the fact that treatment is usually summary—a sweeping removal of the enlarged organ regardless of all æsthetic considerations, a procedure which is adequate but far from ideal.

One variety of excessive development of the breast, the hypertrophy of pubescence, not infrequently arises in sturdy adolescents of agricultural parentage who have been translated to urban surroundings. The pathology of the condition remains obscure. Beginning at the onset of puberty, though sometimes occurring in virgins of more mature age, the disease affects one or both breasts. Usually the left is the more severely affected. The breast becomes unduly enlarged, tense, painful, and sensitive to the lightest touch. Pain is variable in degree; usually it is aching or even throbbing in character. Sometimes the over-

lying skin is flushed and feels hot to the touch. The physical signs are those of a diffuse inflammation, as from a mild grade of infection or from a premature abortive attempt at lactation. Sometimes a little clear milky fluid can be expressed from the nipple.

As may be expected, the condition often causes alarm to the parents and distress to the patients. Whilst it is true that these inflammatory signs usually subside spontaneously in the course of a few months, the breast returning to a size within the limits of normality, occasionally it remains unduly large and heavy, the gland itself harder and more sharply defined than is normal. Sometimes, no doubt, return to the normal is ultimately reached by way of lactation later; the residue probably constitute those cases of massive hypertrophy which require treatment in adult life.

FIG. 1.

True hypertrophy of corpus mammæ. Result of first operation.

In the pendulous, flaccid breast which sometimes follows lactation the gland itself is merely prolapsed, and the condition is so classified by Dartigues,[1] who has written extensively on this subject. There is no hypertrophy of the gland tissue; no symptoms, as a rule, ensue, and treatment is not invited unless the patient, for purely æsthetic reasons, demands correction of what may seem to her a deformity from which she considers she has the right to escape.

In quite a different category are those cases in which there is a true hypertrophy of the corpus mammæ, breasts so grossly enlarged (Fig. 1) that they constitute a burden and a handicap to their unfortunate possessors. So enormous may these become that they rest upon the lap of the patient when she is seated. The mere weight and bulk of the breasts often cause a stooping gait—according to Dartigues an actual kyphosis. There is usually some tenderness on palpation, the superficial veins are unduly prominent and the skin dusky, even cyanosed, particularly around the nipple, which is always displaced towards the lower pole of the breast. Pain, dull, aching and dragging in character, is almost invariable, compelling the patient eventually to seek relief. In the majority no discrete tumour can be felt, but many are manifestly affected by a mazoplasia or a cystic mastitis; indeed, it is doubtful if any mammary gland so excessively enlarged can be regarded as healthy, a fact which influences decisively the manner of treatment necessary. Mental depression is a frequent concomitant, varying widely according to the temperament of the individual, and may, according to Kausch,[2] induce suicidal tendencies.

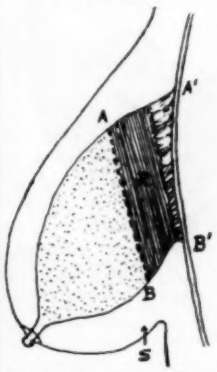
THE EFFECTS OF STASIS.

The tissues of such breasts must clearly suffer deleterious effects from stasis of their circulation and secretions, the penalties of which have been emphasised in recent years by various authors—e.g., Cheatle and Adair et al.[3] The mechanical supports and tight bandaging commonly employed to mitigate the uncomely appearance and physical discomfort aggravate this tendency to stasis. Ewing [4] assigns to stasis the rôle of principal predisposing cause of cancer in the breast, whilst the experiments of Adair et al.,[3] who artificially induced stagnation of milk in 15 mice, producing thereby metastasing tumours in 13, strengthen the belief that in these extremely large human breasts stasis must cause serious changes in their tissues.

In all the mammæ on which I have operated for hypertrophy of the gland, as distinguished from mere prolapse of a more or less healthy gland, the condition had been present for several years, growing slowly but steadily worse; in all there was definite disease, suspected though not demonstrable before operation, namely "mastitis," "cystic mastitis," or "intracanalicular fibro-adenoma" according to the reports of the pathologist. It appears, therefore, that any operation which does not include removal of the gland will be inadequate.

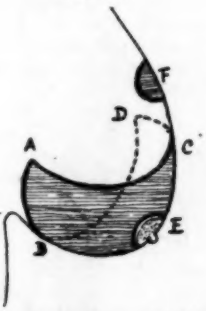
The numerous ingenious operations devised by American and continental surgeons consist, in principle, of a suspension of the corpus mammæ at a higher level. Some diminish the size of the breast by sacrificing part of the fatty capsule, some do not hesitate to take away a discoid or cuneiform portion of the gland itself to achieve an æsthetic result. All agree that preservation of the nipple is essential, all deprecate the complete amputation of the breast in the manner still frequently practised in this country, the results of which are illustrated in my previous paper.[5] So ruthless and summary a method is neither desirable nor necessary. Dartignes claims that operations for æsthetic reasons are essentially French in conception and he coins a curious phrase, the "disgrâce mammaire." He describes four degrees, and his procedure varies accordingly from merely anchoring the gland through a small axillary incision to complete amputation. He considers this last justifiable only for the most severe grades. By the operation which I have evolved the necessity for this latter course can be obviated. Dartignes favours for most cases the operation of Morestin (Fig. 2) which, however, he asserts was first described by Aubert of Marseilles in 1923.

FIG. 2.



Morestin's operation. Case of symptomless enlargement of left mamma in a girl of 17. No disease. S = line of semicircular incision. R = Shaded area representing amount of corpus mammæ removed. A then stitched to A' B then stitched to B'.

FIG. 3.



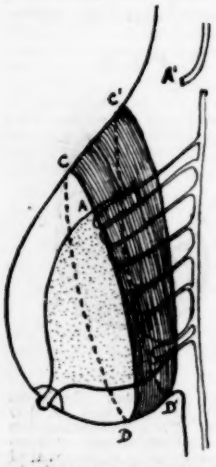
Passot's operation. Incisions A C D (upper) and A B D (lower). Then circular incision E around areola and excision of circular area F, removal of skin and subjacent fat in area A B C D (shaded area) freeing of corpus mammæ to allow lifting of nipple into gap F where it is sutured. Note: sometimes he found it necessary to remove the whole corpus mammæ, more usually he excises a discoid portion to reduce the size of the corpus mammæ.

Morestin[6] attempts to preserve the corpus mammæ, but confesses that he has often been compelled to remove a discoid portion (R), sometimes the whole

gland, to obtain a satisfactory result. This procedure is dictated solely by the necessity to reduce the bulk of the mass, and not from any conviction that the gland is diseased and therefore superfluous. Raymond Passot [7] (Fig. 3) similarly preserves the gland wherever possible, but sometimes has to remove a discoid slice from the base of the gland to lessen the bulk. The plan of this operation is ingenious, and good æsthetic results are claimed for it. Dowkontt[8] (Fig. 4) leaves the corpus mammæ intact. After removal of a circular strip of skin and subjacent fat, he suspends the gland at a higher level by suturing the upper and outer rim to the aponeurosis covering the pectoral muscles and then unites the skin edges. Again the æsthetic results appear to be admirable, but a scar is left over the upper part of the breast at its junction with the chest wall. Moreover, this operation does not seem adequate for any but the milder grades of the affection, and could scarcely be applicable to those cases in which the weight of the corpus mammæ itself is from 2 to 4 lbs.

If my contention be true that in all these cases where intervention is justifiable the organ is hopelessly diseased and useless for lactation, it is necessary to make removal of the gland itself an essential part of the operation. Accepting this as axiomatic, I devised and have employed the following operation in which the corpus mammæ is removed, the fatty envelope and the nipple are preserved, and by which the æsthetic requirements are satisfied.

FIG. 4.



Dowkontt's operation. By circular incisions C D: C' D', removal of skin and fatty envelope between C C' and D D', then stitching the upper margin of the corpus mammæ A to the lip of aponeurosis A raised from the chest wall by a transverse incision, and finally suture of skin edges C to C' and D to D'.

FIG. 5.

H. H. Greenwood's operation. Removal of skin over shaded area A B C D E F, incision of fatty envelope along line A G D, removal of corpus mammæ, and suture of skin edges B to F, C to E.

OPERATION.

In the following operation (Fig. 5), as in all those referred to above, preservation of the areola and nipple is regarded as imperative.

The operation is begun by lightly scratching on the skin a line from the nipple situated at the lower pole, upwards to the point at which it is decided that the transplanted nipple shall lie. Two curved incisions A B C D and A F E D are then made through the skin only. The lower one sweeps upwards slightly in a low curve above the areola; in the upper curved incision a semilunar segment F E is excised, to receive later the portion B C; the intervening portion of skin is then dissected off and removed. The fatty capsule is then incised down to the gland along the line A G D, placed nearer to the lower incision to safeguard the nutrition of the lower flap. By keeping close to the surface of the corpus mammæ the two flaps of the fatty covering can be dissected in a continuous layer back as far as the margin of the gland all round; the bundle of lactiferous ducts, after being isolated, is severed cleanly as near as possible to their junction with the gland.

The flaps are enveloped in large moist swabs whilst the whole of the corpus mammæ is being removed; all bleeding points are carefully secured, and a small drain leading from the cavity is inserted through a stab puncture at the most dependent point of the reconstructed breast, and left for 24 to 48 hours. The fatty capsule is now drawn together by a few fine catgut sutures, being so disposed as to reproduce as nearly as possible the contour of the norma organ. The skin edges are united by fine fishing-gut sutures or by Michel's clips. Abundant dressings and moderately firm bandaging limit effusion and add greatly to the comfort of the patient.

FIG. 6. FIG. 7.

Photographs from same case as Fig. 1. Result of second operation.

The photographs (Figs. 1, 6, and 7) are from a patient, aged 37 years, nulliparous, in whom the slowly increasing weight and painfulness of the breasts had become an intolerable burden. The first operation was done on the right breast (Fig. 1) on March 1st, 1931, that on the left side seven weeks later. The immediate result is shown in Figs. 6 and 7, which indicate the substantial diminution effected in size. The latter can be regulated according to the physique of the patient. In this case the cosmetic result improved later still more, but as the patient came from a distance a more recent photograph is not available.

In the published reports of the various methods hitherto employed little comment is made on the subsequent condition of the breast as regards pain, the cosmetic result being emphasised. The five breasts on which I have operated were markedly tender and painful, and there was strong presumption of disease in the corpus mammæ, so that any operation which left the gland seemed likely to fail in an important respect. The operation I have described removes the painful diseased gland, without inflicting an irreparable deformity on a sensitive patient.

We recognise readily enough the distress caused to patients by facial blemishes or disfiguring varicose veins, and make haste to remedy these with all the skill at our command. We are apt to overlook the sensitiveness, very real though less frequently avowed, of a patient who has undergone an unnecessarily mutilating operation on the breast.

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OPENING OF FALKIRK INFIRMARY.—Prince George last week formally opened the new infirmary at Falkirk which has been erected at a cost of £100,000. With the exception of the maternity home and a portion of the isolation block, which are being paid for by the local authorities, the whole of the cost has been raised by voluntary subscriptions. A considerable proportion of the total has been provided by working people, who gave twopence and threepence a week for two or three years.

ULCUS TROPICUM,

WITH A REFERENCE TO ITS TREATMENT BY X RAYS.

By T. R. F. Kerby, M.R.C.S. Eng., D.M.R.E.

Ulcus tropicum is mentioned as early as 1792 by Hunter in Jamaica. His description is in general agreement with that given in this paper. After 1792 numerous references are to be found, usually identifying the ulcers with the part of the world in which the observer has seen them. Later it became obvious that the condition was widespread and not localised to one particular geographical area. It has numerous synonyms but to-day they are seldom used. Among other names are the following: Yemen ulcer, Aden ulcer, Cochin sore, Mozambique ulcer, Sarmes (Congo), and Phagedæna tropica.

The condition is found in all tropical and subtropical parts of America, Africa, and Asia. It is very much more common in men than in women and children. Indeed, to see a tropical ulcer in a woman or child is, in my experience, quite rare.

ÆTIOLOGY.

The assertion is repeated in many text-books that ulcus tropicum is frequently a tertiary manifestation of syphilis or yaws. With this I do not agree, except in so far as it is possible that an untreated tertiary syphilide might, by superinfection, become a tropical ulcer. In my experience, antisyphilitic measures have little therapeutic value in tropical ulcer and there should be little room for error if the Wassermann reaction is taken in all doubtful cases.

Vincent has found fusiform bacilli and spirilla in smears from these ulcers, and Prowazek, Holbach and Todd attach some ætiological significance to the *Spirochæta schaudinii* (Prowazek, 1907), a very active motile spirochæte 10-20μ in length with a well-marked undulating membrane and a short flagellum. It was suggested that this organism was transmitted by a leech but, on inquiry, I can find no evidence associating the occurrence of tropical ulcer with leech bites in Northern Rhodesia. I regret that no bacteriological work on this question has been possible as yet in this country. All that can be said from observations here is that in a smear from any tropical ulcer various micrococci, bacilli, spirochætes, and fusiform bacilli have been seen.

The starting point of an ulcer is always, in my experience, a scratch, wound, or insect bite, and frequently one finds a new ulcer arising from the site of an old ulcer previously treated. The assumption, in my opinion, is that secondary infection has supervened on the primary trauma.

With these local causes it is nearly always found that the ulcer is in an exposed position—e.g., leg, usually—on a poor adult male with naked legs and feet. In this connexion it is interesting to observe that the incidence of ulcus tropicum among the native employees of the Rhodesia railways has decreased enormously wherever the wearing of puttees has been insisted upon. It is usual to find that the patient's resistance is lowered by debilitating diseases such as ankylostomiasis, malaria, scurvy, or filariasis, which are so widespread in tropical Africa.

Tropical ulcer and veld sore are now regarded as two separate conditions. The differential diagnosis can be difficult, and no work has been done in this country on the association of the *B. diphtheriæ* with veld sore. But treatment by antidiphtheritic serum is rapidly successful in a true veld sore and has no effect on a tropical ulcer.[1]

For a paper, followed by a discussion, on attempts to grow the *Spirochæta schaudinii*, with inoculation experiments, those interested are referred to Smith.[2]

Diet and calcium deficiency seem to have a very considerable ætiological significance. The well-fed and well-paid native is rarely found with a tropical ulcer. In my practice all these cases are put on a generous diet immediately on admission; calcium and cod-liver oil are administered daily, and any intercurrent disease is treated.

PATHOLOGY.

Unfortunately, no distinctive features have been found on pathological examination. A mass of granulation tissue is seen, usually covered by a fibrinous layer containing detritus and spirochætes and bacteria, together with some eosinophil leucocytes. Only once has a tropical ulcer been proved to be communicable by inoculation. This was done by Lloyd Patterson,[1] who bandaged a swab smeared with discharge from an ulcer on to an abrasion from which the scab had been removed, and succeeded in producing a tropical ulcer. Interesting confirmation of the view that these ulcers are communicable is found in the fact that officials touring from village to village report that in most villages no tropical ulcers are seen and then in one isolated village a series of six or more will be found. My own impression, entirely unconfirmed by any bacteriological or entomological work, is that the infection is, in all probability, carried by flies. If this is so it should be possible, by preventing access of flies to the ulcers, to prevent spread of infection from them to clean wounds in the same ward. In practice I have found this to be the case, and prophylaxis therefore will depend on protection of the skin from abrasions and, when abrasions occur, the immediate application of antiseptic dressings. This is, in substance, the prophylaxis that has been used in this territory for some years now, and if properly applied it is undoubtedly successful.

Healing is apparently never spontaneous, and in any case is always slow and proceeds by granulation from the periphery, leaving a thick, white scar which at first is soft and easily broken down, with a consequent renewal of the ulceration.

SYMPTOMS.

At the outset there is a painless swelling which is soft and may be fluctuating. Then a break in the skin is seen from which a serous discharge exudes. This is followed by rapid breaking-down into an ulcer with raised, thickened edges. The ulcers are usually single and rounded but may be multiple. A greyish-yellow, foul-smelling slough now forms and, if no treatment is given, the ulcer rapidly deepens. It may also extend laterally, and there is an occasional tendency to the serpiginous type, but usually the spread is by increase in depth, so that in a remarkably short time muscles and tendons are involved and periostitis develops. This may lead to a diffuse osteitis and osteomyelitis with huge involucra and sequestra, as a result of massive necrosis. Subsequent contractures and deformities are most disabling. On occasion, the untreated case progresses to septicæmia and death.

VARIOUS METHODS OF TREATMENT.

It is a remarkable fact that very little space is devoted in the standard works on tropical medicine

[1] Manson-Bahr, P.: Manson's Tropical Diseases, 1925.
[2] Smith, E. C.: Proc. Roy. Soc. Med. (Sect. Trop. Dis.), 1930, xxiv., 1.

to this disabling condition. This can, I think, only be explained on the supposition that no really satisfactory treatment has yet been evolved, and no specific treatment is possible owing to the general doubt regarding ætiology. It is for this reason that, as suggested in Manson's "Tropical Diseases," I decided to try the effect of X ray therapy. Before discussing a series of cases treated by radiotherapy I propose to outline the more generally used methods of treatment.

An essential preliminary to any form of treatment is to cleanse the surface of the ulcer. This may be done either by using powerful caustics, such as pure carbolic acid, or by curettage. Personally I prefer curettage under local or general anæsthesia, and I regard it as essential to remove all sloughing and unhealthy tissue and also to cut away with scissors the undermined and overhanging edges. All my cases are treated in this way and, in my view, it is useless to hope to heal one of these ulcers unless a thorough preparation of this kind is first undertaken.

Another feature which must be common to all forms of treatment is the elimination of any intercurrent affection of the type mentioned under ætiology. With this goes the natural corollary that a generous mixed diet with an abundance of green vegetables and fresh fruit must be ensured.

The only drug I use now is calcium in conjunction with cod-liver oil, for I consider that deficiency in lime salts is a marked feature in the natives of some parts of this territory. I have not found that opium has the specific effect on the phagedænic process that is claimed for it. Nor does iodide of potash seem to make any considerable difference.

Local Treatments.—A multitude of lotions and ointments have been used by numerous people. The object of all is the same—viz., to stimulate the callous and slowly healing tissues to greater activity and more rapid healing. The most popular in the text-books is 1/1000 perchloride of mercury lotion followed by 5–20 per cent. protargol ointment or 8 per cent. scarlet-red ointment. In the Congo Belge good results are claimed for a powder containing iodoform 2 parts, calcium chloride 20 parts, sodium bicarbonate 78 parts. I have not found this remarkably successful, though it has occasionally been useful. Wet eusol dressings, saline, zinc sulphate, and other lotions have been used. Of the dyes, I have tried methyl violet, brilliant green, and acriflavine. Here again some measure of success can be claimed but results are not consistent. A powder containing zinc oxide and iodoform is popular, and certainly produces a fair number of good results, but, after trying all the remedies already mentioned, I have no hesitation in saying that easily my best results were obtained by a thorough curettage with the application of "bipp." Following this procedure the ulcer is treated on general surgical principles by eusol or other dressings.

Skin Grafts.—When there is a large area to granulate up, skin grafts are of the greatest value in hastening healing, but two not inconsiderable difficulties have to be met. One is the attitude of the native patient who objects to having a new "chilonda" (i.e., ulcer) made, as he thinks, to obtain the skin for grafting, and the other is the great difficulty in preserving asepsis once the grafting has been done.

Antivirus.—Six cases have been treated ab initio by staphylococcus antivirus which was kindly supplied to me by Glaxo Laboratories for the purpose. Unfortunately my work in the Native Hospital was interrupted at this point, but there is no doubt in my mind of the remarkably good effect the antivirus had in cleaning up an ulcer which had received no other treatment. I am definitely of opinion that this line of treatment is well worth extended trial.

Vaccine Therapy.—Investigations are in progress in Salisbury, Southern Rhodesia, with a view to the production of a specific vaccine. The Director of Veterinary Research informs me that so far no "stock" vaccine has been evolved and, as no facilities exist here for the making of vaccines from swabs, I have been unable to investigate this line of treatment.

Strapping.—When the ulcer is clean and healing from the edges, firm strapping with zinc oxide strapping is definitely useful. I have had no opportunity of trying elastoplast bandages on these cases. But as the question of expense is of paramount importance, I have abandoned my original scheme of firm strapping of the whole circumference of the limb and now employ a piece of strapping which overlaps the healing edge of the ulcer by one inch. I find that this may safely be left in position for a week. When it is removed there is always a certain amount of discharge but, provided that the preliminary curettage has been thorough and no necrotic material has been left behind, it will be found that surprising progress in healing has been made. I think that the advantage of strapping lies in the fact that the edges of the ulcer are approximated and the delicate epithelial cells are protected from injury.

General.—I have come to the definite conclusion that isolation of these cases in so-called "tropical ulcer wards" is not necessary and, in fact, is to be deprecated. I now admit them to the general surgical ward, where their beds may be alongside a "clean" hernia or gastro-enterostomy case, and the orderlies are trained to exercise the usual care while doing dressings and are told that transference of infection should never occur. So far I have not had any case of infection of a clean wound from a tropical ulcer in the ward. This result is, in a large measure, due to the fact that the sister personally supervises every dressing; and here I wish to emphasise a point which I regard as of the utmost importance—namely, that, good as African orderlies can be and often are, the best results are only obtained by rigid supervision of all their work by the medical officer or sister on duty. If dressings are left to the orderlies without supervision I find that a definite increase in the length of stay in hospital results.

I regard rest in bed as important in the early stages and allow the patient to walk about only when healing has definitely begun and the ulcer has been strapped.

X RAY AND ELECTRICAL THERAPY.

I have searched in vain for any references to previous work on the treatment of ulcus tropicum by X radiation. The librarian at the Royal Society of Medicine has been unable to help me, after a kind and careful search. I have therefore based my treatment on suggestions kindly given me by Dr. J. H. D. Webster and Dr. A. E. Barclay. Two lines of treatment have been tried, each in a series of 25 cases.

Method A.—First treatment: 5 H. at 80 k.v. unfiltered; 23 cm. F.s.d.; 3 m.a. Area irradiated includes a margin of about 1 cm. of skin around ulcer. Ten days later a series of five weekly doses of 2 H. at 100 k.v.; 23 cm. F.s.d.; 3 m.a.; 0·5 mm. Al. filter.

Method B.—The only difference lies in the fact that in this method I have omitted the first unfiltered dose and given a series of six doses at seven-day intervals of 2 H. at 100 k.v.; 23 cm. F.s.d.; 3 m.a.; 0·5 mm Al.; again including in the area irradiated a margin of the skin around the ulcer.

During the course of X ray treatment the ulcers were swabbed daily with saline, and plain lint soaked

in saline was the only dressing applied. As I have mentioned previously, all necrotic tissue was first curetted away under general anæsthesia before the course was begun.

ZINC IONISATION.

Twenty-five cases were treated by this method. I have found it particularly useful in healing up residual areas of ulceration which, though clean and apparently healthy, refuse to granulate up and epithelialise. I have been unable to satisfy myself that this method has any great practical value in treating the large tropical ulcers ab initio, and on the whole I am inclined now to reserve ionisation for the occasional treatment of small residual indolent patches of a partially healed ulcer. For ionisation a 1 per cent. solution of zinc sulphate has been used and the current intensity has been at the rate of 2 m.a. to the square inch for 20–30 minutes.

The type of case chosen for X ray therapy was the chronic indolent type which had existed for some time or had resisted other methods of treatment. My reason for this choice was that I find that when a case comes up early it is comparatively easy to heal the ulcer by the method I have outlined, and consequently there seemed to be no necessity to use an expensive (and not always available) method of treatment. The results of X ray therapy are, in my opinion, distinctly disappointing. I have been quite unable to satisfy myself that any appreciable improvement was caused by X radiation, and the eventual healing of the ulcers treated by this method was, I think, due to the preliminary curettage and the daily cleansing of the ulcers.

Method.	Ulcers treated.	Average duration before beginning treatment (patient's statement).	Average number of days before healing was complete.	Healed.	Unhealed.
X ray therapy "A."	25	4 months	98 days	20	2 absconded. 1 died. 1 handed over to surgeon. 1 still in hosp.
X ray therapy "B."	26	4½ months	99 days	21	1 died. 4 still in hosp.
Zinc ionisation.	25	As this treatment was usually employed in conjunction with, or after, other forms of treatment, no figures can be given.			
"Bipp."	25	1 month	31 days	25	nil.
Peroxide, fomentations; eusol dressings.	25	3 weeks	51 days	24	1 absconded.

METHOD OF TREATING ULCUS TROPICUM WITHOUT PRELIMINARY CURETTAGE.

As many cases of this condition occur in native districts and are attended at dispensaries which are only occasionally visited by a medical officer, I have tried to work out a method of treatment which can be carried out with more or less success by the African orderly in charge of the dispensary. A method that has been reasonably satisfactory in the case of recent ulcers has been to give the ulcer a preliminary thorough swabbing with hydrogen peroxide (and here the orderly needs a heavy hand if the method is to be effective) followed by boric fomentations and then eusol or other dressings. This method is, however, quite unsuitable for the chronic ulcer and, in my opinion, these cases should be sent immediately to the nearest station at which there is a medical officer. A record of results of cases treated is given in the Table.

CONCLUSIONS.

1. *Prophylaxis* depends upon: (*a*) Adequate nutrition and freedom from debilitating disease. (*b*) Protection of exposed parts from trauma (e.g., labourers should wear puttees and shoes). (*c*) Prompt application of antiseptic dressings to all minor injuries. (*d*) Early application for treatment when an ulcer begins to develop. (*e*) (*c*) and (*d*) involve the provision of trained medical orderlies at dispensaries, or in villages, who will supply dressings and educate the native mind. All gangs of labourers should have a medical orderly attached to them.

Of one thing I am convinced, and that is that these ulcers should almost never occur in natives employed by Europeans. A very small amount of supervision should suffice almost entirely to prevent the occurrence of ulcus tropicum in industrial areas.

2. *Treatment.*—I favour the following routine treatment:

(*a*) As soon as possible after admission, the blood, urine, and fæces are examined and a routine physical examination of the patient is made. Treatment is begun at once for any pathological condition discovered in the examinations, and the patient is put on a liberal mixed diet with as much fruit and fresh vegetables as possible. If no other drug is found necessary (to treat intercurrent disease), calcium lactate and cod-liver oil are prescribed. The patient remains in bed, and the bowels are kept well open.

(*b*) Under general anæsthesia the ulcer is curetted with a blunt curette and the undermined and indurated edges are clipped away with scissors. All pockets are well opened and, if necessary, the bone is scraped and sometimes the medullary cavity will require to be opened.

(*c*) Bipp is now packed into the ulcer, lint applied, the limb firmly bandaged, and the patient returned to bed. The number of times Bipp is repeated is a matter for the discretion of the medical attendant in the individual case. It rarely needs repeating after five or six days.

(*d*) Wet eusol dressings are then applied twice daily until the ulcer is healthy and clean and a fine ingrowth of new skin begins to appear.

(*e*) Zinc oxide strapping is then applied so that an area of one inch around the ulcer is included. This is left in situ for a week, at the end of which time it is removed, the ulcer is cleaned up with eusol, and the strapping is reapplied. About this time the patient is usually allowed to get up and stroll about the grounds. In some cases he is now allowed to come up as an out-patient.

In conclusion, I have to express my thanks to Dr. P. H. Ward, Director of Medical and Sanitary Services in this territory, for permission to carry out this work in the Native Hospital, Livingstone. I have also to thank the staff, both European and native, of this hospital for their assistance. I must also apologise for the lack of references and express my indebtedness to the authors of Manson's "Tropical Diseases," Byam and Archibald's "Practice of Medicine in the Tropics," and Castellani and Chalmers' "Manual of Tropical Medicine."

Livingstone, Northern Rhodesia.

DURHAM COUNTY HOSPITAL.—The scheme of reorganisation proposed by Dr. Charles Franks, the county medical officer of health, proposes the reduction of the number of isolation hospitals from 28 with 700 beds to 12 with 582 beds, and that there should be three small-pox hospitals instead of ten. Dr. Franks found that in 1930 the beds were occupied on only 138 days. The reduced beds would thus still leave a sufficiently large margin to deal with any moderate epidemic. Extensions of the remaining hospitals could be made economically.

CLINICAL AND LABORATORY NOTES

A CASE OF RECURRING SPONTANEOUS PNEUMOTHORAX

WITH ACUTE PRESSURE SYMPTOMS.

By H. Selby, M.B., B.S.Lond.,

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In spontaneous pneumothorax due to tuberculosis the air gains entrance to the pleural space through a breach in the visceral pleura following the breaking down of a subpleural focus. The rupture may be small and rapidly closed by the resultant retraction of the lung; or large and remain patent; or it may be valvular. In the first case, intrathoracic pressure will be little changed; in the second, free communication will exist between the air in the bronchi and that in the pleura so that pressure will be atmospheric and the degree of collapse variable; in the third case, an increasing positive pressure will result with maximal collapse and its results. Introduction into the pleura of contaminated air and products of the causative disease is usually followed by the formation of fluid or pus. If distress is severe, relief is obtained by inserting a needle through the chest wall and allowing some of the air to escape. The following case showed a combination of unusual features.

A. B., aged 21. No family history of tuberculosis. Complained of cough and lassitude 18 months previously, but continued at work until very slight hæmoptysis occurred six months ago when the sputum was examined and found to contain tubercle bacilli. He was ordered to stay in bed, and shortly afterwards developed a spontaneous left pneumothorax with apparent complete collapse of the lung and great displacement of the heart. He remained in bed for six months, and was admitted into this sanatorium on June 18th, 1930. On admission his condition was moderate, temperature 97°–99° F., pulse-rate 90–110, signs of active tuberculosis in both lungs, left lung fully re-expanded, heart normal in position.

On July 29th, 1930, he suddenly became collapsed, complaining of pain in the left chest and difficulty of breathing. Spontaneous pneumothorax was diagnosed. During that night his condition becoming gradually worse a pneumothorax needle was introduced, a small positive pressure was found, and complete relief was obtained by letting out some air. Next morning the dyspnœa increased and the pulse became feeble; a needle was again inserted, 1400 c.cm. of air being allowed slowly to escape, the final mean pressure being reduced to atmospheric. During the next few hours his condition steadily deteriorated, dyspnœa was urgent, pulse bad, cyanosis considerable, and the impulse of the heart could be felt only in the right axilla. The needle was reintroduced and connected by a tube to a bottle of weak antiseptic at the bedside. On this occasion the pressure was too high to be read on the water manometer. The urgent symptoms soon passed off and the patient remained comfortable, the latter half of each inspiratory act being accompanied by a stream of bubbles into the bottle.

On each subsequent day, tests were made to see whether compensation had been established, by partial or complete clamping of the tube leading from the needle, and eventually while the patient was asleep; but on each occasion, and also on two occasions when the needle became blocked by serum, the attempt resulted in the return of alarming symptoms. On the ninth day partial clamping of the tube could be tolerated with the assistance of narcotics, and on the tenth day the needle was removed, cyanosis still being marked, temperature 100° F., pulse-rate 130–140, respiration 40–48. Re-expansion of the lung was slow, X ray showing complete collapse with the heart still on the right side of the sternum four weeks later, and collapse of the upper half of the lung and some mediastinal displacement eight weeks later.

The history of the first attack of left spontaneous pneumothorax was confirmed by the patient's own doctor, Dr. Mary C. Elliot, who noted complete collapse of the lung with great displacement of the heart. Some adhesions may of course have been present on each occasion and have been ruptured by the high pressure, but no evidence of this was present on the second occasion and none of the usual after-effects occurred. This contrasts with the usual experience in treatment by artificial pneumothorax, so often cut short by the development of obliterative pleurisy, and it would have been expected that during the course of slow re-expansion after the first attack some adhesions would have formed. It may be that repeated punctures, variations in intrapleural pressure, and prolonged collapse of the lung predispose to pleural thickening and subsequent adhesions; cases, however, have been described in which collapse has been obtained several months after an artificial pneumothorax had been allowed to re-expand.

No exudation into the pleural cavity was diagnosed on the first occasion, and none was formed on the second occasion in spite of presumably severe contamination from the lung and irritation by the presence of a needle for many days. The rupture through the visceral pleura would appear to have been of a valvular nature in view of the persistently increasing intrapleural pressure, and it is likely that compensation occurred when the rupture became fully patent rather than when it healed or was closed by compression. As usual in a tuberculous pneumothorax there was no precipitating factor causing rise in intrapulmonary pressure on either occasion. Both attacks occurred while the patient was at rest in bed.

SUPPURATIVE GONOCOCCAL ARTHRITIS IN A CHILD.

By James Crooks, M.B. Edin., F.R.C.S. Eng.,

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AND

A. Gordon Signy, M.R.C.S. Eng.,

CLINICAL ASSISTANT IN THE VENEREAL DISEASES DEPARTMENT OF THE HOSPITAL.

This case seems worthy of record in view of the rarity of gonococcal suppuration in joints as a complication of vulvo-vaginitis in children. It is the only example of this condition that has been seen in an experience of over 15 years and 250 cases of vulvo-vaginitis, at the Hospital for Sick Children. David Lees[1] also reports that "in 200 cases of vulvo-vaginitis no cases of arthritis had occurred, although some American workers give figures as high as 40–50 per cent."

A girl, aged 4½ years, came to the Hospital complaining of swelling and pain of the right wrist-joint for 10 days. The mother stated that both knees, the left wrist, and the right ankle had been similarly but less severely inflamed during the last three weeks; they had subsided without treatment. For one month there had been a vaginal discharge.

The child looked ill, but the temperature and pulse were normal. The right wrist was red, swollen, hot, and tender, and movement was exquisitely painful. The swelling, which was fluctuant, was most marked on the dorsum of the wrist. The left wrist was slightly swollen, and its movements were limited,

[1] Lees, D.: The Lancet, 1931, i., 640.

but it was not painful, nor was there fluctuation. The knees and ankles were normal. Radiography of the right wrist showed no bony change. The wrist was aspirated and 3 c.cm. of purulent synovial fluid were withdrawn. There was a purulent vulvo-vaginitis, and vaginal swabs were taken. In both the vaginal smear and the joint fluid gonococci and many pus cells were present. Blood culture was negative.

Both wrist-joints were immobilised, and gonococcal vaccine in doses ranging from 2½ millions to 75 millions were given at weekly intervals. The vulvo-vaginitis was treated by Protargol packs and daily douching with chloramine T. solution. No further aspiration of the wrist-joint was necessary. But for a temporary increase in swelling of the left wrist on the fourth and fifth days the inflammation in the joints subsided rapidly, so that they were normal in appearance and function in a fortnight. The vaginal discharge ceased, and within three months repeated vaginal smears were negative to gonococci.

We have to thank Mr. E. I. Lloyd and Dr. Nabarro for permission to publish this note.

TWO CASES OF UTERUS DIDELPHYS.

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THE following are two unusual examples of uterus didelphys:—

CASE 1. *Complete uterus didelphys with double vagina.*—A woman, aged 20, married six years, was admitted to the Royal Hospital, Bagdad, on April 4th, 1931, complaining of sterility. Apart from scanty three-day menses recurring every 20–25 days, there was nothing of note in the history, and she was a well-developed young woman with normal secondary sexual characteristics. Per vaginam, above a small cervix, a shade larger than the tip of my second finger, there was no central body but on either side and apparently attached to it, a small pear-shaped mass, and lateral to these easily palpable ovaries. No visual vaginal examination was made. At operation on May 4th (intra-thecal percaine) two mobile "half" uteri, widely separated above were found to be fused just above the cervix. Each was about 2½ in. long and had in the normal site a patent tube and normal ovary. A slice was removed from the medial surface of each down to a point where both cavities met and the remaining musculature of each half sutured together without difficulty or tension. Ten days later a probe introduced into the cervix readily reached the new fundus. On withdrawing the speculum, I noticed an aperture, ¼ in. in diameter, to the right of the vagina. Digital exploration demonstrated that this was the narrowed ostium of a right-sided vagina, of considerably smaller bore than the left, from which it was separated by a stout septum the upper end of which intervened between two cervices, both completely circular. Probes passed into each met in the middle line immediately above them.

It is evident that the paring of the two halves prior to their suture was not carried low enough to disclose the presence of the right-sided cervix, which had not, but should have been discovered before operation.

CASE 2. *Removal of the left half of a uterus didelphys seven months after labour in the right half.*—A patient, aged 30, was admitted to the Royal Hospital, Bagdad, on Nov. 17th, 1931, complaining of pain in the left hypogastrium of seven months' duration. Married 13 years, her first pregnancy had terminated seven months before admission, in the birth at the eighth month of a girl who died on the twelfth day. A stormy puerperium, with fever, left-sided pain and vaginal discharge had kept her in bed for three months. For the ensuing four months she had had severe attacks of fever with increased pain, but no discharge. Her periods both before and after pregnancy were irregular, coming on every 10–15 days and lasting 4–6 days. Abdominal examination showed only marked tenderness in the left hypogastrium. Bimanually the cervix was normal in size and position, the uterus large with marked deviation to the right, and the right ovary palpable. On the left side there was a hard tender mass about the size of a tangerine orange.

The abdomen was opened under intrathecal percaine on Nov. 21st. To the large uterus lying well to the right side was attached at the normal site a healthy right ovary and patent tube. There was no evidence of a left tube or ovary. Low down on the left a somewhat pear-shaped mass, its upper end firmly bound to the rectum and Douglas's pouch by dense adhesions and its lower end apparently fixed to the upper part of the cervix was dissected out as far as its neck, on division of which a thick, chocolate-coloured, slightly foul-smelling fluid escaped from small openings in both cut surfaces. The remaining lower portion of the mass was densely adherent in its upper part to the cervix medially and in the base of its inferior expanded portion to the vaginal wall. On removal it consisted of a smooth thick-walled sac—the walls being twice as thick where they enclosed a small opening superiorly. It contained a similar fluid. On superimposition and section of the two parts of the mass, it was seen to comprise a uterus and cervix measuring 2½ in. and a vagina 1½ in. long. Dissection on its left side revealed an ovary and tube densely matted to the uterus and to each other. The patient made a normal recovery and was discharged on Dec. 6th.

It is difficult to reconstruct the sequence of events in Case 2 which undoubtedly represents a condition of uterus didelphys. It seems more reasonable to suppose from the presence of the pent-up menstrual fluid that the puerperal inflammatory attack had resulted in the closure of a previously existing inter-vaginal orifice, of which there was no trace in the right vagina, than that the menses had regularly escaped into the abdomen till the tube was closed by the inflammatory process. Whatever the explanation it is remarkable that the right uterus and its appendages suffered so little from the inflammation as compared with the left, presumably due to better natural drainage.

It may be of interest to record that apart from the patient in Case 2, who was a Muslim, all my patients with gross malformation of uterus and vagina have been Nestorian Christians (Assyrians). The latest is that of a case of uterus bicornis whose abdomen I explored on August 10th, 1931, suspecting an ectopic gestation. I found, instead, a pregnancy in the right horn and on Dec. 4th she was delivered of female twins. The explanation of the greater incidence amongst Christians is, I think, to be found in their greater willingness to submit to examination and not to any degeneracy of the Assyrians who, although since 1917 they can hardly be described as a tribal community, are a strong virile race with no signs of excessive interbreeding.

I wish to thank the Inspector-General of Health Services in Iraq for permission to publish this note.

LYMINGTON COTTAGE HOSPITAL.—Extensions and improvements of this hospital have just been completed. A new wing has been added containing six private wards and the necessary accompaniments, and, with money left by the late Mr. Barklie Henry and given by his family, an operating theatre, X ray and massage departments have been provided.

NORTH STAFFORDSHIRE RADIUM CENTRE.—The North Staffordshire Royal Infirmary has been recognised as a regional radium centre, with the use of £5000 worth of radium. A deficit of £947 on the year's working of the hospital brings up the accumulated deficit to £9684. The total cost of each in-patient last year was £9 12*s.* 7*d.*, a decrease of £1 3*s.* 0½*d.*, and the average cost per head per day was 9*s.* 5*d.*, a decrease of 8½*d.* In-patients numbered 5445, a decrease of 203, owing to the temporary closing of several wards for modernisation and redecoration. Out-patients numbered 27,206, a large decrease. At £53,654 the ordinary income fell by £3938; the extraordinary income (mainly legacies) fell by over £5000 to a little over £4000.

MEDICAL SOCIETIES

MEDICAL SOCIETY OF LONDON.

A MEETING of this society on Jan. 25th, with Mr. HERBERT TILLEY, the President, in the chair, was devoted to a discussion on the causation and treatment of

Essential Hypertension.

Dr. GEOFFREY EVANS said that despite many debates the subject was still controversial and indefinite. The term "essential hypertension" was differently used by different people, and he intended to limit it to a condition in which the blood pressure was 170 mm. Hg systolic, or more, and 90 mm. diastolic, or more, over a period of several days at least, with the patient at rest. In these cases there was often some evidence of hypertrophy of the left ventricle and an accentuation of the aortic second sound, which was not obvious in transitory or paroxysmal hypertension arising from emotion, fatigue, or other cause. Cases of persistent hypertension due to renal disease must of course be ruled out from the "essential" group, and also cases in which the rise of blood pressure was symptomatic—whether of retroperitoneal tumour, alcoholic excess, lead poisoning, circulatory failure, infection, or endocrine disturbance.

In essential hypertension there was often a hereditary factor. Thus one patient whose condition was diagnosed at the age of 12 as arterio-sclerosis, and who subsequently avoided over-fatigue, alcohol, and tobacco had a blood pressure of 176/116 at the age of 50. On inquiry it was found that his father died of organic heart disease at 60, his father's two parents of cerebral hæmorrhage when a little over 70, his two sisters of cerebral hæmorrhage at 48 and 60. The patient's mother was alive and well, but her mother died of organic morbus cordis. A striking characteristic of people with essential hypertension was their heavy build, with short thick neck, the females being more of the acromegalic type; the connexion between a heavy build, and obesity, diabetes, and persistent hypertension was well recognised. Some insurance statistics made out that half the cases of hypertension were persons over average weight, and the causes of their deaths were apoplexy, heart disease, and nephritis, in that order. The effect of treatment confirmed this observation, for in some cases reduction of weight was accompanied by reduction of blood pressure. T. S. P. Strangeways had believed that gout was associated with hyperpiesia—a condition from which nephritis was excluded—and had pointed out the association of osteo-arthritis with arterio-sclerosis. Dr. Evans did not know whether these were ætiological factors, but perhaps things responsible for one condition might also be held responsible for the other.

FUNCTIONAL AND STRUCTURAL PATHOLOGY.

The profession was still left in doubt about the nature and causation of essential hypertension. One could approach the pathology from two points of view—that of function and that of structure. Functionally it was due to increased resistance in the peripheral systemic circulation. The hypertension was maintained by increased activity of the heart and of the vessels which had to maintain the higher tension. With this increased tension, the reservoir part of the arterial system—the aorta and the largest of the arteries—was stretched, and this stretching resulted in a loss of elasticity, so that pressure was further increased; hence, necessarily, the systolic pressure must increase out of proportion to the diastolic. What determined this persistent hypertension? Was it disturbance of central or peripheral control? Harvey, Cushing, and Starling had shown that anæmia of the bulbar centre caused hypertension, an outflow of vaso-constrictor impulses, in particular to the arterioles, and a rise in systemic pressure. Dr. Evans had looked for an explanation of bulbar anæmia in terms of disease of small vessels supplying the medulla, but without success. There might be chemical changes not yet recognised; or there might be simply an inherited instability of the vasomotor centre; or possibly toxins acted on it.

Could any help be obtained from the morbid anatomy? There was, first, a physiological response to over-function—i.e., proliferation of the media and some thickening of the intima of the vessels. There was also fatty degeneration and obliteration of lumen in the arterioles, and the same in the parent vessels, but without fatty degeneration; and the latter change occurred in some organs only. It took place in the spleen and kidneys to a great extent, also in the suprarenals, the medulla, the pancreas, and to a less extent in stomach and intestines, not in the heart or skeletal muscles. He imagined there was a pathological agent producing both structural and functional change. The nature of this change might throw light on its cause. He did not agree that it was due to arterial hypertrophy. The condition existing had been termed a diffuse hyperplastic sclerosis or arteriolo-sclerosis, which was better than the term arterio-capillary fibrosis, for the change was not fibrotic but proliferative. The lesion might be inflammatory, but if so, one should be looking for chemical toxins rather than emotional strain as a cause. Anderson and Keith had shown that in persistent hypertension there was a thickening of the internal elastic lamina and proliferation of the lining endothelial cells, sometimes accompanied by proliferation of the sub-endothelial tissues, and these changes pointed to some chemical stimulus causing inflammatory reaction.

There was no special treatment for hypertension, and many a person had hypertension without suffering from it; in this respect it was like the fibrosis resulting from healed tubercle. It was necessary to discover whether the hypertension in the particular patient was a symptom of active disease, and whether he was actually suffering from his high tension. If so, it was he who needed treatment and not the hypertension.

Dr. G. ARBOUR STEPHENS said that blood-pressure readings were seldom taken in children, but in view of Dr. Evans's differentiation he thought it would be necessary in future to take the blood pressure of patients of all ages, so as to be able to say whether a rise was temporary or permanent, and how long it persisted in various forms of disease. The pressure depended on the quantity of the blood, its quality, the degree of contraction of the arteries, and the force of the ventricular contraction. The purpose of the circulation was to convey oxygen from the lungs, in which the oxygen tension was about 100 mm. Hg to the tissues, where it was only 20 to 40 mm. This transfer could only be effected if the blood was under suitable pressure. His own description of normal blood

pressure was "that pressure due to contraction of the arteries under which the red and white cells of the blood can thrive and function to the best advantage." That defined also the basic pressure; there was additional pressure at each heart-beat, and the two combined to constitute the systolic pressure. An increased basic blood pressure interfered with the oxygen-carrying capacity of the red cells, for it modified their surface tension. On the other hand, such a poison as lead in the blood caused a more powerful contraction of arteries—i.e., it raised the basic pressure. He suggested that in diffuse hyperplastic sclerosis the activity of the endothelial cells represented a struggle on the part of those cells to obtain the supply of oxygen which the raised basic pressure interfered with.

Dr. F. PARKES WEBER expressed his belief that, for practical purposes, there was no essential—i.e., primary—hypertension, any more than there was an essential hypertrophy of the heart. In cases of permanent hypertension with an average systolic pressure up to 200 mm. of mercury he thought the condition almost always represented a conservative compensatory or life-prolonging reaction to some cause, either known or unknown. When one heard of some noted person having lived a very long time in spite of his having a very high blood pressure, which had resisted all attempts to permanently lower it, what had probably happened was that he had lived so long in spite of some condition which had been more or less compensated by his high pressure. Indeed, it might be this continued high pressure which had prolonged his useful life, and had his heart not been able to maintain this pressure he would probably have died in middle age. In such cases he thought everything pointed to the high pressure being secondary and compensatory. Prolonged bodily and mental rest tended to lower the blood pressure temporarily. Apart from renal disease, he thought the cause of hypertension in many cases was the arterio-sclerosis which Dr. Evans years ago claimed to be the anatomical manifestation of hyperpiesia. Often, he thought, permanent hypertension represented a special type of reaction to the stress of life.

THE TOXIC CAUSE.

Dr. H. BATTY SHAW said that in his view hyperpiesia was of chemical origin. If one was not content with an occasional reading of blood pressure, but took it each night and morning for weeks and months, it would be found to fall periodically to 60 or 70 mm., and a day or two later return to the former height. That fact was a complete answer to those who still maintained that hyperpiesis was no more or less than a reaction to occlusive disease of arteries or arterioles. If the latter view were correct, why did pressure fall without any direct treatment? Also, having fallen so deeply, why did it return to its former level? To him the answer was clear: that the malady was a biochemical one, and that therefore one would look in vain at the bedside for the ætiology; one must go to the chemist for the solution. The former idea that this sustained high pressure was due to a disorder of the suprarenal gland was now generally regarded as exploded. Dr. Evans stated that arterio-sclerosis was an intermediate product, and that it was responsible for the hypertension, but in laying stress on intimal proliferation of vessels and fatty degeneration he thought that Dr. Evans was asking too much of his theory. The speaker was not aware of toxins being produced by fatty degeneration or other changes in the walls of vessels except those due directly to bacteria there. The white patches and retinitis in association with hyperpiesia he considered were due to rupture of the small vessels there, the bursting having been due not primarily to the hyperpiesis or the toxins, but to the patient having been infected, this infection being responsible for the damaged state of the capillaries.

Sir JOHN BROADBENT said that before the distinction was made between hyperpiesis and renal disease it was thought that the sustained high blood pressure was due to deficient elimination of nitrogenous bodies by the kidneys. That idea was done away with because many cases of high pressure had no renal disease. Efforts to find free iodine in the blood of these patients were not successful. He thought most would now agree that the cause was some toxin. Starling, it was true, discovered that anæmia of the vasomotor centre would cause prolonged high blood pressure, but no disease was known in which that centre was specially anæmic. High blood pressure could not continue without increased peripheral resistance; there must be some cause acting on the arterioles as well as on the vasomotor centre. The toxin responsible might not necessarily be a bacterial one. Many people were needlessly frightened by being told they had high blood pressure, and they sought drugs to bring it down; it was far better to put them to bed and keep them on a low diet.

Mr. EARDLEY HOLLAND said that the gynæcologist was sometimes confronted with women who had hyperpiesis in pregnancy, and were advised to terminate their pregnancy, and, he thought, rightly. Occasionally he had cases which illustrated climacteric causes of high pressure; he did not know why, but variations of blood pressure were very common at the climacteric period. It was a time of failure of hormones. He was interested in the possibility of uterine hæmorrhage occurring in association with high blood pressure. He had long refused to believe that high blood pressure could cause the menstrual periods to increase in duration or in quantity.

Prof. FREDERICK LANGMEAD said he understood that the importance of the suprarenal glands in this connexion was now considered to be overrated, and that opinion was veering round to the pressor substances, to toxins—derived from it was not clear where. No one with much experience of autopsies could deny that patients dying with high blood pressure and cerebral hæmorrhage or heart failure often showed considerable hyperplasia of the suprarenal bodies. Where should this factor be placed in the ætiology?

Dr. IZOD BENNETT thought that not all renal consequences could be ruled out in a discussion of this sort. Renal ischæmia must be included as one of the three great menaces to life caused by hypertension. Much instruction could be drawn from the group of cases in South Australia, where there were many cases of chronic hypertension and renal failure in young persons, which had been traced to lead poisoning. Dr. Bennett alluded to the value of venesection in hyperpiesia.

Dr. H. LETHEBY TIDY said that in every case where a patient was known to have died of permanent essential hypertension a change in the nature of an intimal hypertrophy had been found—that change which Dr. Evans described as diffuse hyperplastic sclerosis. After studying the history of the famous Bristol family one could not doubt the hereditary nature of prolonged high blood pressure associated with intimal hypertrophy. Sydenham

had declared that to him all manifestations of disease, however harmful, were evidences of a protective reaction on the part of the organism. At present it was impossible to say which came first, intimal hypertrophy or hypertension. When the condition became advanced there was always arteriolo-sclerosis present.

Dr. BERNARD SCHLESINGER referred to a group of cases which had a periodic syndrome consisting of migraine, cyclical vomiting, vaso-vagal attacks, and vertigo. In a number of these cases there was a definite hyperpiesia. But, in contrast to the cases under discussion, in remedying the syndrome the blood pressure tended to fall. The idea was that they had some peripheral vasomotor contraction, and hyperpiesia existed as a temporary compensating phenomenon.

ROYAL SOCIETY OF MEDICINE.

SECTION OF PHYSICAL MEDICINE.

AT the first meeting of this newly constituted section, held on Jan. 15th, with Dr. F. G. THOMSON, the President, in the chair, a paper on the

Meteorological Factors which may Affect Health

was read by Mr. C. G. SIMPSON, D.Sc., Director of the Meteorological Office. He said that whatever might be the opinion of medical men on the interaction between the weather and personal health, the ideas of the man-in-the-street were very hazy, and he would approach the subject from the latter's standpoint. Ordinary people had heard of such factors as atmospheric electricity, ozone, radio-activity, and ultra-violet light, and there was a tendency to ascribe to all and each of them happenings which seemed otherwise obscure. The inquirer should be on his guard concerning this tendency to explain the unfamiliar by the familiar. It was the common custom to pick out coincidences and attribute to them the exaggerated importance of cause and effect. In all such inquiries it was necessary to have the mathematical coefficient, and records must be made at regular intervals, and, if possible, by independent observers. It had always been the custom to associate bad smells with illness, pleasant odours with good health, and this became a danger when the carrying of flowers and perfume boxes was a recognised method of keeping away infection. In assessing the influence of weather on health it was important to separate the physical effect from the psychological. People believed it was unhealthy to sit in a room with closed windows, that the shutting of the windows deprived the contained air of some of its virtue; but in most rooms in this country enough air exchange was effected to obviate any ill-effects. The depression felt by people sitting in a closed room was, Dr. Simpson contended, chiefly psychological. And the ordinary barometric pressure changes could have no detrimental effect on health; certainly they were too gradual for this to happen. An ascent to high altitudes rapidly in an aeroplane, or the quick descent into a coal-mine was a different proposition largely because of the different proportion of oxygen present in the air.

Temperature changes were important, but largely because we objected to the discomfort of feeling very cold or very hot. It was astonishing what changes in temperature the body would tolerate without ill-effects, always providing the air was calm. One night while he was in the Antartic regions he was called out of bed to look at a display of the aurora. Clad only lightly he went outside and remained there over an hour with the temperature at 90° of frost, without coming to any harm. It was a very calm night, so that the loss of heat from the body was at the minimum for the temperature. In such intense cold, however, one would be unable to walk quickly or run, for the intake of air produced acute pain in the throat and bronchi.

With regard to humidity, the air breathed out contained water up to saturation point for the temperature; in the air inspired the proportion of water vapour varied with the weather conditions. If the air was very dry, breathing produced a gradually increasing thirst, owing to the drainage of water from the system. This was the explanation of the great thirst experienced by Polar explorers, which was easily remedied by taking in a certain quantity of snow. The higher the relative humidity of the air, the less the evaporation from the body. It was not true to say that when the air was very humid there was no evaporation taking place from the body, because—in this country at least—the body was always warmer than the surrounding air. For determining the degree of unhealthiness of a climate he commended the wet-bulb thermometer. When, in India, it was estimated that the wet-bulb thermometer would rise to 80°, telegrams were sent to the different cantonments concerned, and exercises and all extra work by the troops were stopped or curtailed.

In Dr. Simpson's view, the only important influence which weather had on the body was its extraction of heat from the body; and when the quantity so extracted was reasonable, the sensation was one of stimulation. The invigorating effect felt on passing from a closed room into a brisk wind was not due to a different composition of the air in the two places, but to the air in motion extracting heat from the body rapidly. The question had been many times discussed as to why two seaside towns on the same coast should bear a different reputation. The difference would usually be found to be solely due to the more bracing town having its promenade right on the sea-front, with nothing to obstruct the wind, while the other, not far away, was largely protected from the landward winds, either by the conformation of the land or because the beach for visitors was some distance back. The merits of seaside places could not be ascribed to ozone; Lord Rayleigh had declared that the quantity in the air was so minute that even the most delicate instruments scarcely recorded any; it was declared to be 3 mg. to 100 kg. of air, and that was equalled by many industrial towns.

Fogs were generally supposed to be unhealthy, but if a fog was clean he did not see why it should not be breathed without detriment, for the composition of the air was then no different. It might, of course, have a depressing mental effect. Dirty fogs were an entirely different matter, for the pollution conveyed to the air was held in suspension by it, and was breathed into the lungs. People put down wonderful things to radiation, but he suggested that there were only three ways in which it could affect the human body: thermally, chemically, and psychologically. Whether they were long waves, as in wireless reception, or short waves, like those of ultra-violet light, their characteristic was that when absorbed they produced heat. Visible rays were absorbed by different bodies according to their colour; a black body absorbed all the visible rays, a white body reflected all, while other colours were intermediate

in this respect. In hot climates the terrestrial radiation was a great factor, and the amount of heat falling on a body there was double that due to the sun alone. And the atmosphere was responsible for a considerable amount of radiation, because of the contained aqueous vapour. Dry oxygen and nitrogen mixed would have no effect. Emanations of terrestrial radiation were absorbed independently of colour. There was considerable chemical action in short wavelengths and every series had a different effect. Because of the layer of ozone in the upper atmosphere there was very little ultra-violet light in solar radiation.

Atmospheric electricity was invoked to explain almost all the unknowns on this subject. If electricity was going to have any effect on the body it could only be through the electrical field, or free electricity, or through radio-activity. There was always a big electrical field in the atmosphere, so big, indeed, that the difference in potential between the head and the feet when walking in the street was 300 volts, a power sufficient to light a lamp. In a thunderstorm one was subjected to an electrical field of something like 100,000 volts between the head and the toes. There was no physiological effect, however, because we were surrounded by an almost perfect non-conductor, the air. The only exception was when rupture occurred in lightning. We were surrounded by a certain amount of free electricity in the form of electrically charged molecules; it had been computed, however, that there was only one charged molecule in a thousand million million neutral molecules.

Dr. Simpson said in conclusion that he had measured radio-activity in all parts of the world, and he found it so infinitesimal that it could have no effect on health.

DISCUSSION.

Dr. J. KINGSTON BARTON exhibited a graph, showing thermometric and barometric variations during December and the first week in January, and simultaneous variations in death-rates from cerebral hæmorrhage, respiratory diseases other than tuberculosis, and old age. With moderate exceptions there was a coincident rise in the death-rate of all these conditions during the period of abnormal temperature for the season of the year.

Dr. R. KING BROWN said he believed that more iodine was obtained by dwellers at the seaside than those inland, probably because of the decomposition of seaweed. Certainly goitre was uncommon in seaside dwellers. In the view of Sir Leonard Hill, the katathermometer showed the bracing quality of seaside air, but his researches had not yet found their due place in the books. He found that in Victoria (Australia) because of the dryness of the air and the amount of wind, high temperatures could be endured without discomfort.

Dr. C. W. BUCKLEY said he had noted for a long time that cases of rheumatic fibrositis, even those kept in bed or in close stuffy rooms, were very much worse while high winds prevailed, especially (at Buxton) winds from the north-west. They were also in a poor condition just before rain, but much better during rain. Often empiricism came by its own in the long run.

Dr. H. S. STANNUS declared that in the tropics he was able to feel when a thunderstorm was approaching. In the ordinary course he felt very active and could walk many miles, but when a storm was approaching he felt listless and unwilling to do anything.

Dr. W. CRAMER remarked that one of the trying features of the weather in this country was the climatic change from day to day. Climatic conditions stimulated the sympathetic system, the system particularly concerned with heat-regulation and the thyroid and adrenal glands. The results of these influences would naturally be manifested psychologically; in fever the sympathetic system was a defensive mechanism.

Dr. SIMPSON replied.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.

ON Jan. 21st at the first meeting of this society to be held in its new premises, Manson House, 26, Portland-place, Dr. C. M. WENYON gave an address on the

Transmission of Leishmaniasis.

He pointed out that since the announcement of Knowles, Napier and Smith in 1924 that the parasite of Indian kala-azar underwent a definite development in the sand-fly *Phlebotomus argentipes* intensive researches had been carried out in India, North China, Sicily, and other places with the object of obtaining evidence that these insects are responsible for the spread of the disease. Similarly since the brothers Sergent, Parrot, Donatien and Béguet, in 1921, had produced oriental sore in man by inoculation of the skin with an emulsion of sand-flies collected at Biskra in Algeria, and Adler and Theodor in 1925 had obtained a like result in Palestine when they inoculated into the skin of a human volunteer flagellates which they had discovered in a *P. papatasii* caught in Jericho, investigations had been concerned very largely with this sand-fly and allied species. In spite of all these investigations, Dr. Wenyon said, in only two or three instances is there evidence that kala-azar and oriental sore have been transmitted experimentally by the bite of a sand-fly. This relative failure has tended towards a revival of older theories and the introduction of new ones, but none of these satisfies requirements.

Leonard Rogers, in 1904, proved that the Leishman-Donovan body was a flagellate of the leptomonas type, and as organisms of this nature are essentially parasites of insects and some other invertebrates and never occur in the free-living condition any theory of transmission of leishmaniasis must take into account the flagellate stage. The Leishman-Donovan body will develop into a leptomonas only in blood media. It will not survive in water or other blood-free fluids, it cannot withstand drying, and quickly dies except in blood media in a culture tube or in the intestine of blood-sucking insects. A typical leptomonas is that of the flea, which lives in the hind-gut and passes from flea to flea directly by means of rounded leishmania forms voided in the flea's dejecta. Such a leptomonas in its natural host displays three important features. First the ingestion by the insect of very few rounded forms leads to heavy infections; secondly, the flagellates attach themselves to the intestinal wall; and thirdly, the infection once established persists for the remainder of the life of the host. Though it has been demonstrated that Leishman-Donovan bodies may escape in the fæces of kala-azar cases suffering from dysentery and even in the urine, that monkeys and other animals may be infected by feeding them with infected tissues, and that occasionally healthy animals will contract infection when kept for months in

close intimacy with infected animals, this contaminative method of infection directly from man to man can hardly occur on a large scale in nature. The organism is not sufficiently resistant, while the flagellate stage is unaccounted for. Again, though the Leishman-Donovan body will develop into a flagellate in the stomach of the bed-bug and will survive for as long as five or six weeks, there is no active multiplication while the three conditions mentioned above are not fulfilled. Moreover there is no correlation between the distribution of kala-azar and oriental sore and bed-bugs. It seems clear that the stomach of the bed-bug is acting merely as an imperfect culture tube and that the development of the Leishman-Donovan body is an abortive one.

The flea at one time was suspect but attempts at transmission by this insect as also with the bed-bug have failed entirely. Similar experiments with other blood-sucking invertebrates have shown that though the parasites may survive in the intestine for some time no development occurs. The sand-fly alone appears to answer all requirements except that of actual experimental transmission. Both kala-azar and oriental sore occur only in districts where these insects are found, though there are places where sand-flies abound in which these diseases are unknown. Nevertheless certain species in their distribution correspond closely with the endemic centres. Thus in India *P. argentipes* is closely associated with kala-azar, and this is true of *P. major* var. *chinensis* and *P. perniciosus* in the North China and the Mediterranean regions respectively. In the case of oriental sore *P. papatasii* and *P. sergenti* can similarly be suspected. If these sand-flies are fed on cases of the diseases in man or experimental animals the parasites ingested undergo a remarkable change. There is a rapid development of the flagellate stage followed by active multiplication till the whole of the midgut is a seething mass of organisms which in the neighbourhood of the proventriculus are attached to the epithelial lining. The infection spreads forwards along the œsophagus to the pharynx and even into the proboscis itself. A condition is produced like that seen in plague-infected fleas in which these regions of the alimentary tract are blocked with plague bacilli. It has been demonstrated by Adler and Theodor that if infected sand-flies are allowed to feed through a membrane on sterile fluid, flagellates can be found in the fluid afterwards, a fact which proves conclusively that flagellates are discharged from the proboscis during the feeding act. Furthermore, it has been demonstrated that the flagellates in the sand-flies are virulent and will produce oriental sore or kala-azar if injected into experimental animals. It is almost impossible to suppose that the whole of this remarkable development is accidental and has no bearing on the ætiology of the diseases.

The complete development as described above does not occur in all sand-flies. There is evidence that for each locality there is the right sand-fly and the right strain of parasite. In India it is the local strain of *Leishmania donovani* and *Phlebotomus argentipes*, in North China the Chinese *L. donovani* and *P. major* var. *chinensis*, in Sicily and Malta *L. infantum* and *P. perniciosus*, in Palestine *L. tropica* and *P. papatasii*, and in Bagdad *L. tropica* and *P. sergenti*. The local strains will develop to some extent in other sand-flies but less completely and with a lower rate of infections. Under favourable conditions when there is opportunity for every sand-fly fed to take up parasites the infection-rate in the species mentioned may approach 100 per cent. This occurs in cases of kala-azar in dogs or experimental hamsters when there is a heavy infection of the skin with *L. donovani* ensuring that every sand-fly has ingested parasites. Apart from the evidence supplied by experiments with the human strains of leishmania certain work with leishmania infections of lizards is very suggestive. Geckos, on which certain species of sand-fly feed almost exclusively, are liable to harbour parasites allied to those of kala-azar and oriental sore. It has been shown in certain cases that the sand-flies become infected by feeding on the geckos but the development occurs in the hind-gut and not in the anterior part of the alimentary canal. It is highly probable that the geckos acquire their infection by devouring infected sand-flies. These observations again indicate a specific relationship between sand-flies and the vertebrate parasites of the leptomonas type.

Though from the data given above it would seem that there was every reason to suppose that sand-flies were the vectors of kala-azar and oriental sore, the final proof of experimental transmission by the bite has been more difficult of realisation than was expected. In the various centres where investigations have been carried on, thousands of infected sand-flies have been fed on human beings or susceptible animals such as the hamster without infection occurring. The extent of the work is well illustrated by the figures given in 1928 by Shortt, head of the Kala-Azar Commission in Assam. In all 273,467 sand-flies have been bred in the laboratory and of these 79,939 were actually fed. Of sand-flies, a large proportion of which were known to be infected, 3590 were fed on white mice, 2325 on the Chinese hamster, and 1247 on human volunteers. Similar though smaller figures appear from the records of work at other centres. In spite of this, experimental transmission was not effected. Nevertheless the work was still continued with the result that from Assam has recently come the report of the successful infection of one hamster by the bite of *P. argentipes*. On this animal there were fed during the course of 17 months 12 dozen *P. argentipes*, the majority of which must have been infected. Previously Adler and Theodor in Palestine had fed on the arm of a volunteer a number of *P. papatasii* infected with *Leishmania tropica*. As in six months no infection had appeared the volunteer was inoculated on the other arm for another purpose. Some months later lesions appeared at the exact spot on which the sand-flies had originally fed, and in these parasites were demonstrated. The man had lived in a part of Jerusalem where imported cases of oriental sore occurred, so that there was a possibility of his acquiring infection there. Nevertheless the appearance of lesions at the actual spot on which the sand-flies had fed is very suggestive that experimental transmission had been effected. Chodukin and his assistants working in Taschkent report that they have transmitted oriental sore from dog to dog. A dog with oriental sore was placed in a fly-proof cage and kept at one end while at the other end were four healthy puppies. Sand-flies were constantly introduced during three months. Two months later one of the puppies was found to have oriental sore. These are the only instances in which there is any possibility that kala-azar and oriental sore have been transmitted by the bite of the sand-fly. It seems evident that there is some missing factor. Knowles has suggested that in Bengal there may be wholesale inoculation of the population and that kala-azar only results when this factor, which may be a depression due to typhoid fever or malaria, is

present. Whatever may be the explanation the evidence to incriminate the sand-fly is so overwhelming, said Dr. Wenyon, that investigations may be continued with confidence that ultimately the missing factor will be discovered and the sand-fly theory of transmission of kala-azar and oriental sore will receive complete justification.

CHELSEA CLINICAL SOCIETY.

Dr. H. RIVERS POLLOCK, the President, took the chair at a meeting of this society held on Jan. 19th at the Hotel Rembrandt, and Mr. GUY C. POLLOCK (Managing Editor of the *Morning Post*) opened a discussion on

Medicine and the Press.

He complained that, while the medical profession claimed to abhor advertisement, it advertised in many ways, such as the exhibition of plates, the compilation of lists of names and qualifications, and the publication of bulletins on the health of celebrities. He felt that the position was ridiculous. The journalist who wanted to publish medical information acceptable to his public must have a signed article; he might induce a big man to defy the General Medical Council, but if he could not, then he had to have his article written by a layman under the guise of "A Harley-street Specialist," or by an insignificant medical man who thought the risk worth taking in order to curry favour with the public. The public was always extremely interested in its health and wanted to know about new diseases and about really serious things like epidemics; it ought to have access to the opinions of properly qualified persons whose worth it could judge from their signatures. The public much preferred the signature of a nonentity to no signature at all. For this reason no newspaper liked the idea of receiving its news from a committee of experts, as suggested by some reformers; moreover, it did not want matter which was being distributed to competitors. He claimed for the *Morning Post* and for Mr. Gwynne, its editor, some recognition of the courage shown in being the first to deal frankly, at the request of the leaders of the medical profession, with the problems of venereal disease.

Sir SQUIRE SPRIGGE (Editor of *The Lancet*) first dealt shortly with articles on public medicine—the administration of the health laws, the management of public medical institutions, vital statistics and similar matters—for which he held that no signature was required, as all the facts could be verified. Indeed, many of such articles could properly be signed. Though articles of this kind were often written in a dull way, there was no reason why they should not be made readable, and their potential educative value was very great. He then admitted that the public wanted the "story" of the general treatment and of the new medical discovery, and to have this story signed, preferably by an eminent authority, but in default by anybody. The General Medical Council had made no rule against signing articles but had expressed a strong adverse opinion in certain directions, and had done so for two reasons: first, no individual view on treatment was worth anything as a general guide; and secondly, the doctor who signed an article on treatment knew for that reason that his views were untrustworthy. The medical profession therefore felt that such a man was certainly pretentious and in all probability would attract to himself the patients of other doctors; he wronged the profession and the public alike. Moreover, he inspired false hopes in the untreated and caused disappointment to those who had been treated in other ways, thus sapping the confidence of the public in the profession.

The speaker suggested tentatively that newspapers might find it very useful to provide themselves with medical "advisers," as distinguished from correspondents. An adviser might never write a word, but would give the editor informed and intimate criticism of medical articles. The leaders of the profession would be perfectly willing to coöperate in this way, provided that they were not hurried. The trouble was that, no matter how important a subject might be, speed of publication was regarded as the first essential, and questions concerning medical matters could not be satisfactorily answered without time and care. Nevertheless, if only editors could arrange for an answer to the simple questions: "Is this old? new? sound? probable? informed? disinterested?" half their difficulties would be over. If medical information were put on that basis of serious responsibility, signatures would not be required; the articles would be signed by the prestige of the paper.

DISCUSSION.

Mr. PHILIP PAGE, a colleague at one time of Mr. Pollock, held that journalism being already overrun with blacklegs, it was a most blessed thing that Harley-street was content to save humanity and to refrain from teaching humanity on paper.

Dr. ERNEST YOUNG deplored the practice of some editors of communicating the names of anonymous and pretentious medical authors to persons who wrote asking for them. In this way a writer might gain far more illegitimate advantage from an unsigned than from a signed article.

Mr. IVOR BACK agreed with all the views of Mr. Pollock. None of his audience, he said, would linger over unsigned articles entitled "Is there a God?" or "Is Death by Hanging Instantaneous?" but if those articles were signed respectively by Dean Inge or Mr. Pierpoint, they would be read with enthusiasm. Moreover, if articles were signed, the public would soon find out which authors were valuable and which were worthless.

Dr. SCOTT STEVENSON (Editor of the *Practitioner*) denied that articles would not be read unless they were signed. He was more interested in the leading articles of *The Lancet* than in the original signed communications. In his early days he had contributed many articles on medicine to the lay press, although he had never signed one; if an article could not get in on its own merits, it would not get in whatever name were appended to it. The good newspaper article was one that was readable and topical.

Dr. K. ECKENSTEIN said that most medical articles in the public press consisted of medical "discoveries," and that the great thing from the journalistic point of view was news.

Dr. C. F. BEEVOR expressed weariness with pseudo-advertising, and advocated the establishment of a committee to be responsible, in all but the leading newspapers, for medical articles and the bulletins of celebrities.

Mr. HERBERT TILLEY inquired where, if Mr. Pollock once admitted the signing of articles, he would draw the limiting line for that form of advertising. At present there was one law for the G.P.

and another for the J.P.: the hard-working general practitioner in a country village who wrote an article in the local press on his own observations on influenza would be attacked by all his colleagues, but a medical knight who wrote an article for the *Times* was handsomely rewarded. If a medical man could sign an article, why could he not have his name on a tin of patent food?

Mr. FRANK COKE remarked that, whereas workers in the large laboratories who made discoveries had an immediate entrée to the lay press, an obscure, lonely worker who made a discovery could only describe it in a medical paper and might fail to gain a hearing even there. The lay press was the only medium by which the news of a discovery reached the patient. All discoveries needed commercial interests to develop them; the obscure man who attempted to develop his discovery commercially was at once accused of selfishness or of having a secret remedy. The speaker advocated the establishment of a board for the purpose of furthering discoveries by obscure workers.

REPLIES.

Mr. POLLOCK retorted to Mr. Tilley that the thin end of the wedge had already been inserted in the shape of pseudo-advertising. He wished to draw no line; the G.M.C., the B.M.A., and many other influences were sufficient to keep advertising within reasonable bounds. He suggested that Dr. Stevenson's unsigned articles had been contributed some years ago and that he would not be so fortunate nowadays. He reiterated that an unsigned article had no commercial value. He brushed aside any idea of a "Lausanne Conference" in the shape of a board or committee, and emphasised the essentially ephemeral nature of newspaper articles.

Sir SQUIRE SPRIGGE agreed that the idea of a board or committee was futile. He assured Mr. Coke that the lonely, obscure research worker was a phantasm. Medical discoveries were almost without exception the result of previous work, founded on work previous to that; the fruit of a long series of triumphs and failures. By the time a real discovery was made, about ten persons could lay reasonable claim to having had something to do with it. He doubted whether, by bidding the unknown and lonely discoverer to go away, any injustice had ever been done.

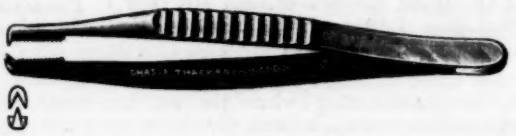
COLSTON RESEARCH SOCIETY, BRISTOL.

This society was founded over 30 years ago, as the University College Colston Society, to assist the Bristol University College financially, and to foster the idea of a University of Bristol. When at the end of ten years the University came into existence the society decided to devote itself to the encouragement of research in the University. A collection is made each year among the citizens of Bristol by the president, who is elected for one year only, and many thousands of pounds have been raised and used for this purpose. In the last few years the collection has averaged about £800. In 1931 Mr. Falk, the president, received a special gift of £5000 from eight donors for research in medicine, and it has been decided to apply the income of this fund to the provision of one or more Colston Medical Research Fellowships of not less than £100 per annum each, which shall be awarded by the Council of the society. They are intended primarily for clinical work, though other medical subjects are not excluded, and they will be open to any member of the medical profession in Bristol, preference being given to graduates or members of the teaching staff of the University. The work must be carried out in the University itself, or in one of the clinical institutions associated with it, and the Fellowships will be renewable yearly at discretion. Applications should reach the hon. secretary of the society, 12, Small-street, Bristol, on or before April 30th of each year.

NEW INVENTIONS

COMBINED TOOTHED DISSECTING AND SUTURE-HOLDING FORCEPS.

THE forceps here illustrated is designed for use as an ordinary toothed dissecting forceps, as well as for holding and keeping suture material taut during



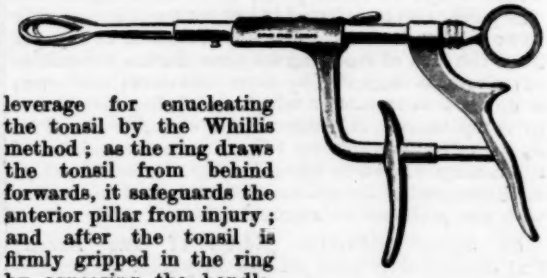
a continuous stitch, and in tying knots. The suture material may be readily grasped and held firmly between the evenly approximating surfaces without damage.

The instrument has been made for me by Chas. F. Thackray, Regent-street, London, W.

LANCELOT BROMLEY, M.Ch., F.R.C.S.

A MODIFIED FAHNESTOCK TONSIL ÉCRASEUR.

I HAVE been using a modification of Fahnestock's tonsil écraseur which has a double handle, thus affording a squeezing action. The advantages of this instrument (here illustrated) are: it gives good



leverage for enucleating the tonsil by the Whillis method; as the ring draws the tonsil from behind forwards, it safeguards the anterior pillar from injury; and after the tonsil is firmly gripped in the ring by squeezing the handle, the process is continued by bringing the screw into action. By slowly rotating the ring the base of the tonsil is strangled and separated; if five minutes are allowed for each tonsil, the separation is practically bloodless and causes a minimum amount of trauma. The drawbacks are that the instrument is not suitable for rapid tonsillectomy with ethyl chloride; and it requires a prominent tonsil. For a flat tonsil, I prefer the Jenkin's guillotine.

Messrs. Down Bros., St. Thomas's-street, London, S.E., have carried out my design of this instrument.

T. B. JOBSON, M.D.

INFLUENZA IN A HOSPITAL.—Owing to influenza among the staff, Barnet Cottage Hospital, Herts, has had to refuse new patients. Seventeen inmates have been removed elsewhere; the 13 that remain cannot safely be removed. One of the maids has died, and it is reported that the matron, the sister-in-charge, two probationer nurses, two ward-maids, and another maid are ill.

REVIEWS AND NOTICES OF BOOKS

An Index of Prognosis

And End-Results of Treatment. Fourth edition. By Various Authors. Edited by A. RENDLE SHORT, M.D., F.R.C.S., Hon. Surgeon, Bristol Royal Infirmary. Bristol: John Wright and Sons, Ltd. 1932. Pp. 599. 42*s*.

FEW subjects offer greater difficulty to physician or surgeon than that of prognosis; upon no subject is it more difficult to be precise. The individual variations in constitution, heredity, age, and the like offer so many problems that the outcome of similar lesions in different individuals can rarely be prophesied. Mass statistics and "average" figures provide no certain guides. At the same time a consideration of all the factors in a given case viewed in the light of the collected statistics of many hundreds of cases should give some insight into the end-results of treatment or the course of pathological processes. This book is more than a mere series of tables and figures with lists of insurance companies' statistics of mortality-rates or expectation of life. It is a balanced and judicial account of the main points which must be considered collectively before an opinion is formed as to prognosis. The distinguished list of authors has been increased in this edition by 13 new contributors, and much new work has been incorporated. It is satisfactory to notice that in the nine years since the last edition was published the prognosis in such conditions as diabetes, cancer, general paralysis, pernicious anæmia, amœbic dysentery, among other diseases, has greatly improved. The most recent statistics are included, and many older ones are necessarily viewed in a new light. It is exceedingly important that vague generalisations about the results of treatment should as far as possible be replaced by definite information. Those who have not previously studied an index of prognosis will almost certainly be astonished at the verdict in connexion with diseases. A nebulous idea that on the whole patients "do well" or "die young" is often quite at variance with ascertained facts.

This book should be in the possession of every practitioner. It will prove a valuable friend, and if he remembers that percentages and statistics represent average findings and not any individual case he will not be betrayed by his reliance on the cumulative experience here recorded.

Handbook of Sanitary Law.

Eleventh edition. By B. BURNETT HAM, M.D., D.P.H. Camb. London: H. K. Lewis and Co. 1931. Pp. 336. 7*s*. 6*d*.

IN its new edition, Dr. Burnett Ham's Handbook of Sanitary Law continues to compress a marvellous store of information within a small compass. Intended for the use of candidates for public health qualifications, it may well also (as its author hopes) serve medical officers of health as a convenient work of reference. When first produced in 1899, its preface complained of the complicated condition of the Public Health Acts and similar statutes. The state of the law is now far worse. Even if the subject of housing was tidied up in 1925, section 63 (i) of the Housing Act of 1930 is a good instance of an alteration which can have a devastating effect upon exposition. Dr. Burnett Ham attacks these difficulties with success. The year named for the compulsory notification of tuberculosis on p. 209 ought, perhaps, to be 1912 instead of 1913; and the summary of cholera and plague precautions and of port sanitary duties might perhaps mention the curiously christened Public Health (Deratisation of Ships) Regulations of 1929. But a close examination of the Handbook makes a critic diffident of offering corrections however small or of discovering omissions. The author will probably turn out to be right, and the supposed omissions may in fact be included somewhere or other in this multum in parvo.

Matas Birthday Volume.

A Collection of Surgical Essays written in honour of Rudolph Matas, New Orleans. New York: Paul B. Hoeber Inc. 1931. Pp. 396. $10.00.

A SERIES of surgical essays has been published in honour of the seventieth birthday of Rudolph Matas by a group of his friends and former pupils. The first contribution is an admirable account by Dr. Mont R. Reid, of Cincinnati, of a group of cases of vascular lesions illustrating some of the principles taught by Prof. Matas. He describes the remarkable recovery of a bedridden invalid following the extirpation of a femoral arterio-venous aneurysm. This patient had been regarded as suffering from cirrhosis of the liver, and his ascites had been controlled by frequent paracentesis. Dr. Reid's paper is followed by a report on cases of Raynaud's disease and thrombo-angiitis obliterans of the upper limbs treated by ramisection by Prof. Alessandri, of Rome. The section on vascular surgery, to which Matas has made so many brilliant contributions, is completed by a paper on personal experiences in vascular surgery by Dr. Hubert A. Royster. Dr. Bloodgood, of Baltimore, contributes a biographical sketch of the late Prof. Halsted, entitled "Halsted Thirty-six Years Ago," while Dr. J. M. T. Finney and Dr. J. M. T. Finney, jun., describe a case of hypertrophic tuberculosis of the ileum, to which they append a full bibliography. Dr. Robert C. Coffey, of Portland, supplies a well-illustrated article on cancer of the rectum, which is quite outstanding in a galaxy of admirable essays. In it he describes his modification of the abdomino-perineal operation and gives statistics of his own cases. Dr. E. Ribas y Ribas, of Barcelona, reports a case of intestinal obstruction due to an obscure developmental anomaly in which the whole of the small intestine was removed, the patient surviving for six months. In an interesting study of cancer in the North American negro, Dr. Frederick L. Hoffman shows that the cancer death-rate has shown a persistent rise during the last thirty years, and now tends to approximate to that of the white population. J. Shelton Horsley and John B. Deaver write on cancer of the stomach and breast respectively, and Dr. George W. Crile contributes one of his typically stimulating articles on anæsthesia. Articles on rhinoplasty by Dr. Paul Moure, of Paris, on fistulas following hydatid cysts by Dr. Trias Pujol, of Barcelona, and on the place of the senses in the development of science by Dr. W. J. Mayo follow. Prof. D. P. D. Wilkie is the sole British contributor with an essay on splenectomy, and it would be hard to better his description of the operation, which is very

well illustrated, and his accounts of treated cases. The last essay in the book is by Dr. Howard Lilienthal on the Operative Treatment of Phthisis, in which he makes a powerful plea to surgeons not to withhold their help from the desperate case, illustrating his thesis with ten case reports. The plea is particularly appropriate in this book, because for many years past advanced cases of vascular disease have been referred to Matas from all over America, and very seldom has he refused to intervene. Though no exponent of that form of heroic surgery which is manifested by dramatic scenes in the operating theatre, Matas has always been prepared to fight with death not only during an operation but for long hours afterwards at the bedside, and even in desperate cases his skill has sometimes been victorious. The final contribution to the volume is a note by Dr. Evarts A. Graham on the reaction of bronchial fistulæ to acute respiratory infections.

The book is admirably printed on beautiful paper. It has 102 illustrations, five in colour, and a portrait of Dr. Matas. It is a work worthy of the man in whose honour it is written.

The Causation of Chronic Gastro-duodenal Ulcers.

By J. JACQUES SPIRA, M.R.C.S.Eng., L.R.C.P.Lond. London: Humphrey Milford, Oxford University Press. 1931. Pp. 78. 7*s.* 6*d.*

IN the preface to this book Dr. Spira apologises for recapitulating a number of known facts which have forced him to include a great number of references. We feel that if any apology is necessary for the publication of so well written a work, it should be for launching upon a harassed world a theory, exposed by the author with ingenuity and eloquence, but without, as far as we can ascertain, a single attempt on his part to support it by experimental work. Dr. Spira is, in fact, one of those who would impose upon others the ungrateful task of testing his own ingenious ideas. He believes that the regurgitation of bile into the stomach and excess of fat in the diet are the chief factors responsible for the production of chronic gastric ulcer. He has read a lot, and his reading enables him to select quotations and experiments from over a hundred authorities in support of his personal theory. Without for a moment purposing to do so, we suggest that it would be equally possible to select from the same authorities quotations and experiments which are against his theory. He says, "the final test of the value of this theory must entirely depend upon the results obtained from its clinical application." How many thousands of inert substances have been offered to the medical profession and their patients during the last ten years with convincing recommendations somewhat similarly worded? Why, if Dr. Spira's theory is correct, are there admittedly such good clinical results obtained from forms of treatment which not only ignore his theory, but are often framed in such a manner as to be doomed to failure if his theory represented the whole or even the greater part of the truth?

We feel that no good can come of a more detailed review of this book, which we have examined with great care. It may fairly be described as a well-written thesis quite unworthy of general acceptance until such time as its author is prepared to abandon the collection of literature, and to perform a few crucial experiments by which alone the value of his theory can be tested.

Journal of Pathology and Bacteriology.

THE January number (Vol. XXXV., No. 1) contains the following papers: A case of reticulum cell carcinoma of thymus, by S. McDonald, Junr. (Newcastle). A full description of an example of this rare condition in a man of 59.—Mitosis in the hepatic metastases of malignant tumours, by R. A. Willis (Melbourne). By actual enumeration of the proportion of cells in mitosis it is shown that hepatic metastases proliferate much more quickly than the primary tumour, and it is suggested that the liver provides a particularly favourable environment for growth.—Sacculated intracerebral aneurysm of the middle cerebral artery, by W. H. Chase (Montreal). In a woman of 30. The histology shows that the aneurysm developed as the result of a congenital defect of the media at a point of branching.—Polypi coli, by W. Susman (Manchester). Polyps of the colon are found in about 5 per cent. of autopsies if they are carefully looked for; of the author's 65 examples, malignancy had developed in four, and in 15 there was carcinoma coli as well.—The action of anti-vaccinial serum on the vaccinia virus, by R. W. Fairbrother (Manchester). The serum soon neutralises the virus if intradermal testing is used, but such mixtures will fatally infect if given into the brain.—The results of intrathecal inoculation of the virus of poliomyelitis in monkeys, by E. W. Hurst (London). The virus does not spread as dyes do, and there is no reason to suppose that the cerebro-spinal fluid is important in its dissemination.—A comparison of the changes in the blood-sugar and blood phosphorus in rabbits following the injection of suspensions of different dead bacteria, by M. E. Delafield (London).—Plasmacytoma of the nasopharynx, by J. W. S. Blacklock and C. Macartney (Glasgow). In a man of 64, and possibly granulomatous rather than neoplastic.—An alcohol-soluble antigen (substance Q) in salmonella agglutination, by P. Bruce White (London). For agglutinin experts.—The dilution ratio of diphtheria antitoxin as a measure of avidity, by A. T. Glenny and Mollie Barr (London) (see p. 252).—The relative incidence of human and bovine tubercle bacilli in tuberculous meningitis in England, by A. S. Griffith (Cambridge). Nineteen of 63 cultures were of bovine type, whence it may be surmised that about 700 persons die each year in England and Wales from tuberculous meningitis of bovine origin.—Capillary hæmangioma of spinal cord associated with syringomyelia, by Dorothy S. Russell (London).—The relation of the liver to the disposal of hæmoglobin, by R. Muir and J. S. Young (Glasgow). Hæmoglobin free in the circulation is not taken up by the liver.—The development of agglutinins for elementary bodies in the course of experimental vaccinia and fowl-pox, by J. C. G. Ledingham (London). After inoculation with vaccinia rabbits sera develop agglutinins for the minute bodies found in the lesions which may well be the virus itself. The antibody curve runs a course differing in no essential particular from that characteristic of ordinary bacterial infections.—Dissociation in vivo of diphtheria toxin-antitoxin mixtures, by A. T. Glenny and Mollie Barr (London) (see p. 252).—Preservation of cultures under liquid paraffin, by H. J. Parish (London). Useful for meningococci and other delicate organisms.—Endometriosis carcinomatosa, by C. Oldfield and M. J. Stewart (Leeds). Malignant endometrial tissue extending through the whole substance of the uterine wall.—Liposarcoma of the broad ligament, by C. Oldfield and M. J. Stewart (Leeds). With a fibrosarcoma of the cervix.—Neurofibromatous epulis, by E. M. Hickman (Leeds). In a boy of 8 with no other signs of von Recklinghausen's disease.

Obituary notices of R. M. Buchanan (portrait), A. S. Warthin (portrait), W. E. Dixon, J. S. C. Douglas (portrait).

THE LANCET.

LONDON: SATURDAY, JANUARY 30, 1932.

BRONCHOSCOPY.

MUCH water has flowed under the bridges since VOLTOLINI, in 1875, first made a direct examination of the trachea and larger bronchi by means of a tube passed through a tracheotomy wound. For 20 years or more after VOLTOLINI'S experiments various isolated attempts were made to examine the trachea and bronchi directly, the chief being that of KIRSTEIN; but the really serious study of bronchoscopy began with KILLIAN, whose work (1897) was continued by BRÜNINGS, and these two men may be said to have laid the foundation of our knowledge on the subject. KILLIAN and BRÜNINGS, using proximal illumination of their instrument, were followed by EINHORN, whose ingenious idea of distal illumination led up to the brilliant technique of CHEVALIER JACKSON. The cases which he described a year ago in moving pictures to the Medical Society of London[1] were a revelation to many who were present, and there is little doubt that his inspiration has had much to do with the increasing interest in bronchoscopy in this country. During the period of ten years ending 1928 bronchoscopic examinations to the number of 7373 were performed in his clinic at Philadelphia, and some estimate of this work can be made from the fact that one of his assistants, Dr. C. J. BUCHER, recently published[2] the bacteriological findings in 118 cases of pulmonary abscess treated by means of the Jackson bronchoscope. Of recent years F. HASLINGER has introduced a new instrument, extensively used in his clinic at Vienna, retaining the proximal illumination of BRÜNINGS. Numerous other instruments are in use, most of them modifications of JACKSON'S.

In our present number we give an account of the use of bronchoscopy for diagnostic purposes by Dr. A. J. SCOTT PINCHIN and Dr. H. V. MORLOCK who, having used the Jackson and Haslinger instruments in their earlier work, have now designed a modification of the former with several new features. Improved forward illumination with a view of the orifices of lateral bronchi is attained by an alteration in lens position, whilst a magnified image is produced by means of a telescope—which incidentally protects the operator from being soiled with expectoration if the patient coughs. An operating telescope provides facilities for the use of forceps and drainage-tube under direct guidance, and a rotary cylinder exhaust pump provides more efficient drainage than has hitherto been possible with previous instruments. In their clinic at Victoria Park they have examined some 450 cases during the last 12 months. On the diagnostic side, with which the present paper only deals, a number of points are raised. In the first place it is made clear that bronchoscopic examination can be used by any physician who is prepared to take pains to acquire the technique. JACKSON himself once carried a bronchoscopic outfit with him on a fishing holiday and spent his time extracting fish-hooks embedded in rubber tubes whilst his colleagues angled. Bronchoscopy is no field for amateur effort; the responsibilities are too serious. But, once the technique is acquired, it is likely to become, like collapse therapy, an important part of the day's work. The cases recorded this week are instructive in their possibilities. In the pulmonary neoplasms, with partial or complete blockage of the bronchus and collapse of lung or suppuration beyond the obstruction, the diagnosis was often made on bronchoscopic examination of the distal portion of the bronchus after other methods of investigation had failed. For the moment the cases of chronic pulmonary suppuration, especially lung abscess, are of prime importance, for here cure may follow accurate diagnosis. Thus a case which had defied diagnosis for four months proved, on bronchoscopic examination, to have an abscess cavity, with an inflamed external division of the right lower-lobe bronchus which prevented natural drainage. Bronchoscopic drainage resulted in cure. In another instance an unsuspected hydatid of lung was diagnosed. Two other cases may be quoted from the record as instructive: an unexplained hæmoptysis of three years' duration was found on bronchoscopic examination to be due to the presence of a vascular septum opposite the right middle-lobe bronchus, and cured by cauterisation; in a sputumless case with doubtful basal signs the bronchial swab revealed the presence of tubercle bacilli.

The writers point out that bronchoscopic examination does not disturb the patient more than the removal of a tooth under local anæsthesia; in more than one-third of the 450 cases of bronchoscopy—all of which were done under local anæsthesia—the patient was able to go home two or three hours later. The fact that patients return regularly to the clinic week by week for the treatment of pulmonary suppuration by this means is an indication of their readiness to submit to repeated bronchoscopy. The establishment of a clinic for this purpose in a chest hospital is evidently a step in the right direction, for the steady down-hill career of many of these cases has hitherto presented a baffling problem for the physician. It may well be that in due course the bronchoscope, which has hitherto been regarded as part of a surgeon's equipment, will become to the physician as valuable as the pneumothorax outfit and the thoracoscope.

[1] THE LANCET, 1930, ii., 1071.
[2] Amer. Jour. Med. Sci., 1930, clxxix., 406.

REFRACTION OF THE EYES IN CHILDREN.

THE normal refraction of children at various ages is not easy to ascertain. It is known that the eyes of any child at birth are practically always hypermetropic with or without astigmatism. At the age of 15, however, though the condition of astigmatism, if any, will be little changed, the eyes may be either hypermetropic, emmetropic, or myopic. In a report issued by the Board of Education on an inquiry into problems connected with defective vision in school-children,[1] it is suggested that a further inquiry should be undertaken to establish a "basic scale" to determine the normal—i.e., average refraction in boys and girls of each age-group from 1 to 15. The report, which has been compiled by a committee under the chairmanship of Sir GEORGE NEWMAN, does not go very far in establishing such a basic scale, but it helps to define our knowledge of the general trend of the refractive changes in childhood, and it suggests certain improvements in the methods of dealing with the problems of vision in the schools for the consideration of education authorities. 2625 unselected children between the ages of 1 and 15 were studied, their refraction being determined by 22 skilled observers according to a uniform scheme laid down by the committee. The main conclusions reached were that simple hypermetropia is by far the commonest condition of refraction met with in children of school age and under, but that the incidence decreases as the age increases, the highest incidence being 87·4 per cent. in the boys of 1–2 age-group and the lowest 53·1 per cent. in the girls of 13–15 age-group. Whether the actual peak in the incidence of hypermetropia comes immediately after birth or between the ages of 1 and 2 appears to be uncertain. Emmetropia is comparatively rare in children under 5, being observed in only 2–3 per cent. of children at the age of admission to school. Later, the incidence increases but does not exceed 10 per cent. in children about to leave school. Myopia is decidedly rare in children under five, only five cases being found in 1166 examinations. With the higher age-groups the incidence increases. Cases followed up during a period of years provide examples of children gradually becoming more myopic as their age increases or actually changing from low hypermetropia to myopia. Astigmatism in children is generally hypermetropic, the incidence of this form varying between 10 to 20 per cent. in the different age-groups, but without, apparently, any definite relation to the age. Some individual children who were re-examined at intervals showed a gradual all-round reduction of hypermetropia, others a reduction affecting one axis, usually the one of higher hypermetropic value. Cases of myopia and mixed astigmatism were too few to base any general conclusions on, but examination of individual children revealed the expected process of change towards an increase of myopia in one or both meridia.

[1] H.M. Stationery Office. 1931. 9d.

The results of the inquiry, as summarised in the report, "indicate that normally the eyes of children are in a dynamic condition; that at birth the normal condition is one of hypermetropia, which is converted as time goes on to one of emmetropia; and that over-action in this otherwise normal process produces a condition of myopia." A practical point arising out of the establishment of this general law is concerned with the prophylaxis of myopia. Emmetropia in the young child is exceptional and may indicate a liability to myopia as the child grows older. It may be desirable that such children should be subjected to more frequent periodical examinations than others, in order that special consideration should be paid to them in the school routine before it is too late. Another practical point concerns hypermetropes. In the routine examination of the State schools the only test at present employed to select those needing special examination is ability to read accurately the distant test-type. In this test the child with a moderate degree of hypermetropia is at no disadvantage compared with the emmetrope, since he has ample power of accommodation, and the test fails to reveal how much of it he is employing. When he is using his eyes for close work the long-continued tax on his accommodative muscles may be undesirable, and may cause a form of what is generally known as "eye-strain." In conditions of enfeebled health from any cause this is only too likely to happen. The report suggests that the present system of examination is defective in this respect and might be improved. It would be comparatively easy to select those children with any considerable manifest hypermetropia for special examination under a mydriatic, though to lay down a general rule that a certain amount of hypermetropia at a certain age called for the prescription of glasses irrespective of the visual acuity would obviously be unwise. It would be well, however, that such cases should be watched so that, if general lassitude or other symptoms should occur, the possibility that glasses are needed should not be forgotten. The treatment of these children should be on individual rather than on general lines.

A reorganisation of the present system of vision testing in schools would involve a slight increase in the work and therefore in expenditure, but it would almost certainly result in an ultimate economy from the national point of view. Incipient myopes and hypermetropes would certainly be benefited by a change of policy. The committee believe, however, that a more accurate determination of the "basic scale" would supply additional information of much value. They recognise that their present report needs supplementing, and that owing to the compromises necessary in drawing general conclusions from a large number of individual figures some possibilities of fallacy may have crept in. They therefore suggest that an individual whole-time worker—not a committee—be appointed to make a further investigation. The investigation, which would probably take about two years, should be so planned as to cover not only the "basic scale" but a number

of subsidiary problems of vision affecting infants and school-children. The Physiology of Vision Committee of the Medical Research Council have been consulted with the object of arranging for such an inquiry, and it seems likely that the project will materialise.

FURTHER PROGRESS IN THE ISOLATION OF THE VITAMINS.

AFTER a long preliminary period in which isolation of vitamins seemed a very remote possibility, we have suddenly arrived at a time when reports of isolations jostle one another for room in the press. Within the last few weeks fresh claims have been made concerning vitamins A, B_1, C, and D. The work of O. and A. RYGH[1] on the anti-scorbutic vitamin C was briefly mentioned in our leading article of Dec. 12th, 1931, but examination of the paper by them which has since become available cannot be said to inspire confidence. They say that narcotin, irradiated with ultra-violet light, and one of its derivatives, prevented the development of symptoms of scurvy in guinea-pigs on a scorbutic diet; but the number of animals used is very small and they were all in bad health or actually died, even though symptoms of scurvy were not recognised. Further, they found that scurvy was not prevented by doses of material slightly higher than those which did prevent it—a very ususual phenomenon. As regards vitamin B_1, WINDAUS and his co-workers,[2] previously associated with the isolation of vitamin D, claim to have prepared a crystalline antineuritic vitamin from yeast. Rice polishings is the material which has hitherto most generally been used for the preparation of concentrates but in this case the same method, the well-known one of JANSEN and DONATH, has been applied to yeast. A crystalline picrolonate, chlor-aurate, and hydrochloride were prepared and the hydrochloride, when injected into pigeons suffering with polyneuritis, was effective in a minimum dose somewhat smaller than that of any previously prepared concentrate. A formula is assigned to the substance, which differs from JANSEN and DONATH'S by including sulphur in the molecule. At the Royal Society last week, a description was given of the further purification, by R. B. BOURDILLON and his team, of their crystalline preparation of vitamin D. The product previously obtained by vacuum distillation of the products of the ultra-violet irradiation of ergosterol was further purified by esterification, by which process the antirachitic activity was doubled. The substance thus obtained is believed to be the same as the vitamin D_2 of O. LINSERT and A. WINDAUS. It would appear also that the vitamin D_1 of WINDAUS is a compound of vitamin D_2 with an inactive substance, referred to as sterol x. For vitamin A an isolation is announced by P. KARRER[3] and his co-workers and J. C. DRUMMOND, I. M. HEILBRON, and R. A. MORTON. The substance obtained by KARRER is not from the classical source, the cod's liver, but from the liver of other fishes (*Scomberesox saurus*, a species of mackerel, and *Hippoglossus hippoglossus*, the halibut); the liver oil of both of these is vastly richer in vitamin A than that of the cod. The final separation was effected by fractional adsorption on fibrous alumina and subsequent elution. The product was an alcohol and could be esterified; when recovered from the ester it had the same composition and gave the same value with the antimony tri-chloride test as before. The formula given is either $C_{20}H_{30}O$ or $C_{22}H_{32}O$. A specimen obtained by distillation gave the same values. A molecular weight of 300–320 is suggested and two structural formulæ are very tentatively put forward; in both of these there is structural resemblance to carotene. It is admitted that this substance may be, though improbably, a mixture; sufficient time has not yet elapsed for the results of the all-important biological test to be known. DRUMMOND and his co-workers announced the result of their isolation of vitamin A to a meeting of the Society of Chemical Industry on Jan. 4th. Their preparation was also made from halibut-liver oil, by a process of fractional distillation, and the formula ascribed is the same as one of those obtained by KARRER. Doubtless, in both these cases, the work of isolation has been greatly facilitated by the use of a source of the vitamin so much richer in it than cod-liver oil, on which previous attempts were made.

[1] Rygh, O. and A.: Hoppe-Seyler's Zeit. f. Physiol. Chem., 1932, cciv., 114.

[2] Windaus, A., Tschesche, R., Ruhkopf, H., Laquer, F., and Schultz, F.: Nachricht. Gesell. Wissensch., Göttingen, 1931, Session of Dec. 18th.

[3] Karrer, P., Morf, R., and Schöpp, K.: Helv. Chim. Acta, 1931, xiv., 1431.

VITAL STATISTICS FOR 1931.

THE Registrar-General has issued a provisional statement of the figures for birth-rate, death-rate, and infant mortality during the year 1931.

—	Birth-rate.	Death-rate.	Infant mortality-rate.
England and Wales..	15·8	12·3	66
107 county boroughs and great towns including London ..	16·1	12·3	70
159 smaller towns ..	15·6	11·3	62
London	15·0	12·6	67

The smaller towns are those with a population in 1921 of 20,000–50,000. The birth- and death-rates for England and Wales relate to the total population and are calculated on the estimated mid-1931 population. The remaining rates are calculated on provisional resident population based on the 1931 Census figures and relate to the total population for births but to the civil population only for deaths. Birth-rate (live-births) and death-rate (crude) are per 1000 population, infant mortality-rate per 1000 live-births.

The Registrar-General remarks that the birth-rate is the lowest on record, being 0·5 per 1000 below the previous lowest, recorded in 1929 and 1930. The death-rate is 0·9 above that for 1930. The infant mortality-rate is 6 per 1000 above that for 1930, but only in 1928 and 1930 has this rate been lower. These provisional figures, which are not likely to require substantial modification, have been issued for the information of medical officers of health and others.

ANNOTATIONS

BIRMINGHAM HOSPITALS CENTRE.

A FORTNIGHT ago, by a majority of 42 out of 470 votes, the subscribers to the scheme for a great Hospitals Centre for Birmingham authorised the executive to proceed with the first part of the plan. This decision was reached at a meeting of the contributories over which the Lord Mayor of Birmingham presided, and at which full statements of all sides of the case were made. The proposed centre is the joint extension scheme of the General and the Queen's Hospitals and will be under the joint management of their boards, and is the result of a unanimous recommendation by a joint committee appointed by the Hospitals Council composed solely of members of the two hospitals. When the project for the establishment of a hospital centre with a medical school in proximity to, and working in connexion with, the University was first mooted it met with general acceptance, and in 14 months £620,000 (including the value of the site) was promised towards its realisation. Some interesting designs were obtained on open competition and the winning design was remarkable for its broadminded recognition of all the needs of a hospital community.[1] Of late, however, the general economic situation has aroused misgivings, and when it was decided to obtain tenders for erecting the first portion of the buildings an agitation arose which had for its object the abandonment of the scheme or, at least, its postponement to a more propitious season. It was urged that it would be impossible in present circumstances to erect and maintain a hospital with 500 beds and a medical school without seriously risking the whole voluntary hospital system of the city. In addition to the £702,000 which the work was estimated to cost, the matter of maintenance loomed up formidably. On the other hand the hospital, when completed, will have 100 pay beds, the need of which is generally admitted. In the 12 months ending with August last, the General Hospital turned away more than 2000 cases officially stated to be in need of "urgent in-patient treatment." Even so the hospital is so short of bed accommodation that day-rooms have had to be turned into wards, while, as the result of the persistent congestion, patients have had to be discharged before their time. Special departments are overcrowded, and there is no room for their expansion. One of the advantages claimed in favour of immediately starting upon the work is that economy will be consulted by the inclusion of certain of the service departments required for the complete scheme. Since the meeting referred to, however, the executive board have decided to postpone action until the beginning of next year. Meanwhile a joint appeal is being made by the General, the Queen's, and the Ear and Throat Hospital for £90,000. Of this sum £50,000 is asked for by the General Hospital, which last year treated more than 8000 in-patients and over 54,000 out-patients and casualties.

DIPHTHERIA IMMUNISATION.

THE deliberate immunisation of children against diphtheria is one of the most substantial advances made in recent years in sanitary bacteriology. There have been troubles and a few accidents, and our knowledge of the details of exactly what happens when toxin rather than toxoid is used is still not wholly complete. The procedure has, however, been abundantly proved to be sound and useful; that there is still room for improvement is shown in two papers published in the last number of the *Journal of Pathology and Bacteriology* (1932, xxxv., 91 and 142) by Mr. A. T. Glenny, D.Sc., and Miss Mollie Barr of the Wellcome Foundation at Beckenham. All preparations of antitoxin do not combine equally firmly with toxin, and with some of them a mixture which is neutral to a test animal in a volume of 1 c.cm. may become poisonous if it is made up with saline to 100 c.cm. That is, the toxin-antitoxin compound dissociates when it is diluted. They now show in a series of exceptionally interesting experiments that the same kind of thing may happen in the body. Thus, in one experiment a series of rabbits were injected intravenously with varying quantities of the same toxin-antitoxin mixture. The animal which received 0·0005 c.cm. survived, seven rabbits which had doses from 0·001 to 0·1 c.cm. died between the fourth and eighth days, while five which received doses ranging from 1 to 10 c.cm. all survived the tenth day. The first animal lived because the amount of toxin it received was not enough to kill it, the last because the dose was so large that when it was diluted in the body fluids the degree of dissociation was not sufficient to set free a fatal amount of toxin; the intermediate animals died because they had more than enough toxin and the dilution in the body was enough to set it free. Was ever the treachery of a simple experiment so well illustrated? And Dr. Glenny substantiates his explanation by a brilliant corollary. Give a rabbit 10 c.cm. of the mixture; it will come to no harm. Two hours later draw off some of its blood and inject 1 c.cm. of its serum into other rabbits which will die unless they are protected with an adequate dose of antitoxin. It seems evident from these experiments that a toxin-antitoxin mixture which proved harmless when tested on guinea-pigs might be poisonous in a child, and it is not easy to devise any simple method of testing which would expose dangerous mixtures with certainty. For practical purposes it is fortunately unnecessary to solve these particular difficulties, since all possible source of danger can be avoided by using, instead of toxin, the modification of toxin prepared by treating it with formalin. This toxoid is not and cannot become poisonous, and it is as efficacious as toxin as an immunising agent for human use. It is clear that toxin-antitoxin mixtures should be given up.

[1] See THE LANCET, 1930, i., 317.

THE MINIMAL LETHAL HOOKWORM LOAD.

Two winters ago the fæces of 73 inmates of the National Training School for Boys, Washington, were microscopically examined at the National Institute of Health and the results are now reported by C. E. Baker.[1] Sixty-seven of them came from the hookworm area of the United States, and they showed a detected hookworm infection rate of 34 per cent. C. W. Stiles[2] has already reported that none of these boys was seriously ill; some were clinical suspects, while regarding several he would have been prepared to make a diagnosis of hookworm disease on their histories, and on physical examination quite independently of the microscope. The school being urban in site and sanitation, it is unreasonable to suggest that this infection was acquired in it; it becomes then a

[1] U.S. Pub. Health Reps. 1931, xlvi., 2980.
[2] Ibid., 1930, xlv., 1763.

measure of that which the boys acquired in their homes; a minimum measure, since only a single examination was made, apparently by smear, and since some worms may well have been lost in the meantime. Though the figures are too few to be of statistical value in measuring hookworm incidence in the endemic area of the United States, they yet fall fairly close to others which are. These were supplied to Stiles by State medical officers of health, and they show that microscopical examination detected hookworm eggs in the fæces of 28·1 per cent. of 121,388 persons investigated in 1929 compared with 33 per cent. of 1,087,665 examined between 1910 and 1914. These percentages are not exactly comparable since they were obtained by various techniques, and such differ greatly in exactness; yet they serve to show the difficult problem which confronts those who direct hookworm campaigns, seeing that in a country in the forefront of our present civilisation, steady work against the hookworm has made such little evident advance in 20 years.

But the objection will certainly be made that these figures take no account of any lessened intensity of infection, of that smaller number of worms per head of the infected which the work of 20 years has presumably effected. The view is, indeed, widely held that hookworm infection can be graded from very light to very heavy according to the worm load carried, and that this grading has clinical significance. In this classification a "moderate" infection is defined as one with between 101 and 500 worms. Although these supposed worm loads are only inferences from egg counts made by a particular technique, it is assumed that they have exact, unconditional and individual application. On this point light has been thrown by L. Schapiro and E. G. Nauck.[3] They carried out 400 routine post-mortem examination at the Hospital San Juan de Dios, Costa Rica. All details necessary for the purpose of their paper were contained in reports on 78 whites and one negro. Twenty-four of these 79 persons died directly from hookworm disease, showing the well-recognised anæmia, general tissue œdema, and fatty degeneration of heart, liver, and kidneys; in them the number of hookworms was determined by careful search of the whole length of the intestines; and the average hookworm load was 257, in spite of the fact that in one body 1262 necators were recovered, the number of ankylostomes not being stated. In the 55 persons dying from causes other than hookworm infection the average load was 26. While then the average load of those killed by these parasites corresponded at the time to death to the class of case which, on mathematical lines, is graded as "moderate," there must have been some of them who would have fallen into the "light" and "very light" mathematical grades, since the writers emphasise the fact, known for many years, that the clinical gravity of a case is not measured by the number of worms harboured at any moment, including that of death. Whether more worms have been harboured earlier in fatal cases is in the nature of things almost impossible to determine, since they are seen only in the last stages. At all events, in these cases the average lethal load was 257. There is an impression that a particular load of *Ancylostoma duodenale* is more harmful than an equal one of *Necator americanus*, and that the latter is essentially the worm which will be found in America. In Costa Rica necators and ankylostomes were as 53 to 47; the last five years have shown that a high or preponderant percentage of the latter has been present in Panama, Paraguay, and Tucuman. Wider and closer search may well extend the distribution of these supposed anomalies.

Schapiro and Nauck also made egg counts of the intestinal contents above and below a point in the transverse colon, and correlated these with the worm counts made from the same bodies. Since during life the egg counts for such correlations are made from fæces, it seems necessary to consider only those made from the lower colon, and perhaps merely to point out that in the first two items of a table furnished by the writers the eggs in this portion of gut were as 197,000 is to 3000, while the numbers of female worms were respectively 318 ankylostomes and 56 necators, and again 36 ankylostomes and 243 necators. Making the fullest allowance for all possible difference in laying power between the two species concerned, these figures show how erratic such correlation may well be. These latest workers add to the evidence countering the assumption that the estimation of worm loads by egg counts is a simple matter; nor does that evidence support the mathematical view that infected persons may confidently be graded into classes of clinical value. Hookworm infection is no more a mathematical problem than are the other ills of man. As Lord Dawson has put it, "Disease is not a standardised product, for, thank heaven, man preserves his individuality in sickness as well as in health; otherwise it would be an uncommonly dull world to live in."

[3] Amer. Jour. Hyg., 1931, xiv., 705.

HEREDITY AND SCHIZOPHRENIA.

THAT heredity plays an important part in the ætiology of schizophrenia has long been recognised. In a recent study of the subject,[1] Manfred Bleuler, the son of Eugen Bleuler, has examined the pedigrees of 100 schizophrenic patients at Bloomingdale Hospital, White Plains, New York. Briefly his findings were as follows: The 100 patients had 351 siblings among whom were 39 psychopaths and marked eccentrics, 9 schizophrenics, and 9 sufferers from other forms of mental disability or defect. Among the 200 parents of the 100 patients were 46 psychopaths and marked eccentrics, 4 schizophrenics, and 14 sufferers from miscellaneous disabilities of psychiatric significance. Among 1109 grandparents and collateral relatives, there were 122 psychopaths and eccentrics, 5 schizophrenics, and 23 sufferers from other mental disturbances. It will be obvious that the records of this last group must have been very incomplete. Dr. Bleuler tentatively discerns a group of six somewhat distinctive cases, in the causation of whose psychoses hereditary and familial factors appear to play no part. These six cases have certain common characteristics. They are obese dysplastics who, before the onset of the psychosis, were good-natured, sluggish, and of somewhat inferior intelligence. The illness began between puberty and the age of 26; its course was rapid and without remissions; and it terminated in a condition of advanced dementia in which the patient yet retained a capacity for affective rapport of the kind sometimes observable in idiots.

The author finds, too, that a familial incidence of abnormal traits is most marked in those patients whose schizophrenia exhibits manic-depressive features. In conducting this investigation, however, he has encountered a difficulty which, in the present state of our knowledge, is almost insuperable. Where is he to draw the line between normality and "marked eccentricity"? Of this last category, the

[1] Journal of Nervous and Mental Disease, 1931, lxxiv., 393.

author makes this highly significant avowal: "if we had made the concept more embracing, we could easily have included the great majority of the 294 siblings of the patients." Some of the quoted cases of psychopaths and marked eccentrics are hardly convincing. Here are two, of which the first is an example somewhat disturbing for medical readers.

"26·66. Male, 41 years old, living in a foreign country. Known as an 'anxious physician' who is constantly in a state of solicitude about his patients."

"30·74. Male, died at 32. Alert and optimistic, a splendid soldier. A heavy drinker who had indulged in alcohol for many years."

This is surely to cast the net widely. By slightly altering, in one direction or another, the line of demarcation between the normal and the "psychopath and marked eccentric," the percentages of the latter could be halved or doubled according to inclination. Too easily may the results of such an investigation depend on subjective factors in the author. They may depend, for instance, on the feelings he entertains towards his teachers and professional elders. If he honours and reveres these in a becoming spirit (as Dr. Bleuler does Prof. Ernst Rüdin) he will be disposed to adopt criteria which will yield such data as will confirm their findings. If, on the other hand, he dislikes them, his drawing of the line will be such as to lead to wholly different results. Or the drawing of the line may be influenced by a desire, conscious or otherwise, to prove or disprove the hereditary nature of mental disorder.

In estimating the significance of genetic factors in mental diseases, the consideration of eccentricities and abnormalities in the ancestors and collateral relatives always plays a prominent part. Though the task is an exceedingly difficult one, it is desirable that an attempt be made by a competent psychiatrist or group of psychiatrists to lay down some sort of distinction between the normal and the abnormal. The line would necessarily be arbitrary, but this would not matter as long as it was definite. Its precise position should be such as to create the simplest possible criteria for the assignment of doubtful cases to one category or the other.

PEPTIC ULCER AND PULMONARY TUBERCULOSIS.

ALTHOUGH an association in the incidence of peptic ulcer and pulmonary tuberculosis has been postulated from time to time for at least three-quarters of a century, its existence has at least as often been both doubted and denied. Mills Sturtevant and L. L. Shapiro [1] conclude that it is the pathologists who have noted an association, while the clinicians for the most part have been sceptical of any connexion between the two disorders. They report an analysis of 7700 necropsies, made at the Bellevue Hospital, New York, among which there were 891 instances of active pulmonary tuberculosis, an incidence of, roughly, 12 per cent. Among the 120 cases with gastric ulcers and scars there were 43 in which the patient had suffered from active pulmonary tuberculosis at the time of death, an incidence of 36 per cent., or three times as high an incidence as amongst those without gastric ulcers. This difference, as it stands, is statistically significant. When the authors reject the cases of healed ulcer as possibly misleading, in that these ulcers may have existed and healed before the onset of the tuberculosis, the significant difference is not materially altered. Looking at the figures from another aspect, they find the incidence of ulcer of the stomach in all necropsies is 1·12 per cent. (86 in 7700), while the incidence of ulcer of the stomach in necropsies showing phthisis is 3·14 per cent. (28 in 891). The difference, 2·02 per cent., is three and a half times its probable error, and therefore significant by the ordinary statistical criterion. An association also is found in other groups of pulmonary and pleural diseases. Searching for a common factor the authors suggest cough. "It is known that vomiting is a cause of gastric erosions. Cough is similar physiologically, is accompanied by marked alterations in intra-abdominal pressure, and may be accompanied by vomiting, if severe and prolonged." The figures are certainly suggestive, but their meaning is by no means easy to grasp. A hospital population is a "select" population; those who die are a "selected" group of those in hospital; those who are submitted to necropsy are still further selected. To interpret the statistics of the post-mortem room is notoriously difficult; to argue from them to the living is dangerous. Possibly the only sound way to solve a problem of this kind is to record the relevant lesions found in a long series of cases in which death was due to accidental causes.

[1] Arch. Int. Med., December, 1931.

DOSAGE OF X RAYS IN MALIGNANT DISEASE.

SPEAKING at a discussion held by the Section of Radiology of the Royal Society of Medicine on Jan. 15th Mr. W. Mayneord said that, of the various effects of X rays, the ionisation they produce in air seems most capable of exact measurement. Accordingly all measurements of X ray doses should be in terms of the international r unit, and this with advantage might also be extended to radium therapy. The choice of this criterion is the more acceptable, he said, because over a fairly wide range of wave-lengths the absorption of X rays in air runs parallel to their absorption in tissue. Hence it is reasonable to suppose that the measurement of X ray doses in international r units affords a means of estimating their biological effects. From the practical standpoint the frequent measurement of the output of X ray tubes is essential for accurate dosage. When it is realised that the output of the tubes may vary considerably from day to day, the importance of such tests need not be stressed. In radium therapy, too, precise dosage depends on a knowledge of the amount and distribution of radium in each tube employed.

From the medical standpoint, on which Dr. Hernaman-Johnson and Dr. Finzi were the principal speakers, the discussion served to show that very many factors must be taken into account in the treatment of malignant disease. Apart from the determination of the doses of X rays which will be lethal to particular tumours—which is seldom an easy matter—there is the difficulty of deciding how best to cope with metastases, present or future. Because of this disturbing factor there appears to be a sharp difference of opinion about the best method of treatment. On the one hand the gratifying results often obtained by early workers using X ray apparatus of low output have led some to conclude that it is possible to treat malignant disease with some success without having recourse to doses of radiation strong enough to kill the primary growth. The measure of success sometimes attending the use of small doses is partly responsible for the view that the action of X rays is an indirect one, stimulating the patient's resistance to the disease. This idea, coupled with the belief that it is almost impossible to administer lethal

doses of X rays to widespread metastases, has led one school of thought to rely on small doses. The opposite school adopts the policy of maximal dosage in which the object is to kill each malignant cell, taking care to protect, as far as possible, the healthy tissue from irradiation. This direct method puts a severe strain upon the patient and courage is often needed to apply a dose deemed large enough to eradicate the disease. The aim is to subject a given volume of malignant tissue to uniform irradiation, and it is claimed that an increase in the penetration of the rays used leads to improved results—which is to be expected from purely physical considerations if uniformity of irradiation is the desideratum. To obtain still greater uniformity of irradiation radium is often implanted in the deeper layers of the growth with beneficial results. How the large doses used in this method should be administered is a question which is engaging many radiologists at the present time. Should the dose be given as a whole or subdivided? The general opinion of those advocating heavy doses of X rays appears to be that split doses are more beneficial than single doses. There is, however, no general consensus about the magnitude of the fractional doses to be applied to particular types of growth or the duration of time between applications.

TREATMENT OF SUBACUTE COMBINED DEGENERATION OF THE CORD.

LIVER treatment has never given the same constant improvement in the nervous symptoms of subacute combined degeneration of the cord as it has in the associated anæmia. This fact has been explained in two ways. It has been maintained, in the first place, that since the lesion is, at least in its late stage, an actual degeneration of nerve tissue, complete recovery could not be expected. This view has received some corroboration from the finding that cases with an acute history, in which probably actual destruction of tissue has not yet taken place, do much better than the more chronic. Secondly, Dr. C. C. Ungley[1] has suggested that the nervous lesion is due to the lack of some factor other than the effective principle in liver, and in our present issue he describes clinical observations to support this hypothesis. He has previously shown that the hæmatopoietic potency of brain is only one-third of that of liver. Now, from treating a series of patients with severe cord lesions first with liver and then with brain, he concludes that the effect of brain upon the nervous system is markedly greater than that of liver. What the possible factor in brain may be he does not indicate, but it is clearly not vitamin A, a lack of which E. Mellanby[2] thought might be responsible for the lesions, since brain contains little of this substance. The improvement noted in Dr. Ungley's cases is definite; but it must be remembered that all observers agree that it is necessary to persist in treatment in order to benefit the nervous symptoms, and in the present experiment brain succeeded liver. Further, brain had the advantage of being given while the patients were under constant supervision, thus ensuring adequate dosage.

In another paper, on p. 230, Dr. W. Sargant suggests that iron in massive dosage will produce what is almost a biblical cure of the nervous symptoms. Knowing that the effects of liver are far from satisfactory, and acting on the observation that the blood picture is rarely of a typical pernicious type, he treated four cases, having severe nervous symptoms, anæmia and achlorhydria, with large doses of Blaud's pill. Within a few weeks two patients who were unable to walk unaided could do so, and the others were much improved. The importance of these observations is unquestionable, since the apparently incurable were cured; but their exact interpretation is open to question. Few would agree with the statement in Osler and McCrae's textbook that in subacute combined degeneration the blood picture of secondary anæmia is more common than that of pernicious anæmia. In fact, such cases in which there is no apparent anæmia may yet show a typical Price-Jones curve. Unfortunately Dr. Sargant gives no exact information concerning the character of the red cells before treatment. In all his cases there was striking hæmatological as well as neurological improvement independent of the initial colour-index. Since iron does not affect the blood picture in pernicious anæmia, except in rare cases with a dual deficiency, while the typical iron deficiency anæmia as described by L. J. Witts does not show nervous symptoms, it seems possible that his four cases fall into a group which has not been hitherto recognised. It is clear that we have still much to learn of the relationship of changes in the hæmatopoietic and nervous systems, and that this knowledge can only come from accurate clinical experiment.

[1] THE LANCET, 1931, ii., 63.

[2] Mellanby, E.: Brain, 1931, liv., 247; see THE LANCET, 1931, ii., 917.

SCOLIOPATHEXIS.

UNDER this title Dr. Egerton L. Pope,[3] professor of medicine in the University of Alberta, describes a group of conditions whose importance is undeniable. Scoliopathexis indicates a perverted state of mind in relation to disease and has as sub-groups pathomimesis, identical with malingering, and pathopleiosis, which includes the clinical types of valetudinarians, neurotics, lead-swingers, and cases of "nerves." The increase of social care for the sick, and of the legal responsibility of employers and others for accidents, is associated with a great increase in the number of such cases, and Prof. Pope appeals to his colleagues to recognise their responsibilities in lifting their patients out of their disabilities at the earliest possible date and before they have lapsed into the mire of scoliopathexis. This appeal he strengthens by warnings as to the pitfalls awaiting the clinician who fails to recognise the initial stage when compensation looms in the distance, and he notes that in pathopleiosis the outstanding motives are the acquisition of money in the form of damages, compensation, or sickness insurance, the escape from legal entanglements likely to result in financial loss or punishment, the desire for sympathy, the escape from distasteful social, domestic, sexual, and occupational relationships.

This vigorous polemic is rich in clinical information and a useful corrective to the pseudo-pathological conceptions underlying such terms as traumatic neurasthenia. Yet it contains elements of danger, and the appearance of "nerves" in the group of pathopleiosis is perhaps correlated with the absence from the bibliography of any reference to recent work on psychopathology. It is novel to read that "in the circulatory system, fainting fits, palpitation, and cardiac pain that is not cardiological, are put forward as distressing features," and to find classified as pathomimesis these well-known symptoms of an anxiety state. This is a

[3] Canad. Med. Assoc. Jour., January, 1932, p. 40.

notable change from the war-time practice of calling such cases "disordered action of the heart" and setting up special heart hospitals for their study, but to regard them as examples of malingering is equally fatal to understanding. Although he pleads that psychotherapy and mental hygiene should have a place in the teaching of clinical therapeutics, yet Prof. Pope's therapy does not seem to have developed beyond the simple principles of assuring the patient that there is nothing the matter with him and then urging him to work. Anyone familiar with the treatment of intelligent "neurotics" knows of the resentment aroused by this method—useful though it may be in selected cases—and even among compensation cases are to be found men whose condition demands informed therapy, which, under present conditions, is unobtainable and in the absence of which they have no alternative but to cling to compensation. With such men the assurance that there is nothing the matter is a direct invitation, almost a compulsion, to produce symptoms that will prove their case. The stigma attached to "nerves" is a hindrance to diagnosis and treatment, and Prof. Pope's reference to war cases reminds us how for a time the mental origin of shell-shock was denied as a libel upon brave men. After stern necessity had enforced a correct view, the psychopathologist then had to fight a battle on another front and defend the sufferers against that therapy which would abolish shell-shock by shooting every man that had it. The statement is true that the legal discontinuance of pensionability for the so-called neuroses would probably lead to great economic saving and eliminate a great deal of valetudinarianism, but how would we apply this principle to telegraphists' or writers' cramp? The answer is already known to the psychopathologist, for the stigma of neurosis has for years prevented us from admitting that these disorders are psychologically determined. The view, now gaining ground, that the compensated disability called miners' nystagmus is largely psychoneurotic would be rightly resisted if Prof. Pope's generalisation represented all that can be offered in the way of understanding and treatment. "Nerves" involve some of the most pressing problems of medicine, and the recognition in a particular case that symptoms do not depend upon physical morbidity is only the beginning of diagnosis, whilst to treat the sufferer from pathological fears or tormenting impulses with doses of optimistic psychology is often the negation of effective therapy. In industrial cases the granting of compensation without treatment, or even accurate diagnosis, has brought about a situation that justifies Prof. Pope's warnings as to our share in producing it; but we must remedy our neglect of psychopathology before we dare exercise moral judgments upon the victims of scoliopathexis.

THE STERILISATION OF WATER BY CATADYN SILVER.

THE problem of sterilisation of water on a scale much smaller than is required by a town's waterworks, and much larger than that of the laboratory, is not an easy one, as those can testify who have had to advise on water-supplies for country houses or small isolated institutions. A process for which great claims have been made—the catadyn process of Herr Krause—has been carefully investigated by Dr. E. V. Suckling, who read a paper on his work at the Public Works, Road, and Transport Congress, held in November at the Agricultural Hall. The process is more or less a secret one; silver in a finely divided form is somehow dispersed over the surface of sand, which is used as a filtering material for the water to be sterilised, or the silver may be distributed on the inner surface of a vessel in which the water is stored. A very minute quantity of silver goes into solution, if indeed this is the proper term, and it is claimed that this small amount, which is of the order of one to six parts per hundred million, will effectually sterilise the water. Dr. Suckling finds that under favourable conditions this claim can be substantiated. The process is slow and delicate, and applicable mainly to waters which are not highly polluted with sulphides, chlorides, iron, or organic matters such as are often found in waters which need sterilisation. It is also costly for use on a large scale. In spite of these drawbacks, which for the present unfit the process for use on the large scale, the entire absence of odour and taste production and the simplicity of the method suggest that it may be found of use in making water fit for drinking when travelling. The catadyn vessels which can be obtained in this country might ease the lot of the continental traveller who, when he does not wish to drink the wine of the country, is forced to choose between what he fears may be diluted sewage and excellent bottled water costing nearly as much as wine and indistinguishable in taste from good tap water. Dr. Suckling expressly states that his experiments, which are fully set out in the paper, were only on the laboratory scale, but they are welcome as affording trustworthy information about an attractive process.

NERVOUS COMPLICATIONS OF GLANDULAR FEVER.

INVOLVEMENT of the central nervous system in glandular fever has not hitherto been suspected but recently two cases have been reported, one from Scandinavia and one from America, that suggest its occurrence. In the first of these, described by A. H. Johansen,[1] the diagnosis does not seem fully established and indeed the only symptom characteristic of glandular fever was a high degree of lymphocytosis associated with the presence of lymphoblasts. General glandular swelling, splenomegaly, and other signs were absent. The second case, described by G. H. Epstein and M. Aameshek,[2] presents a much more typical picture. The characteristic blood changes were fully developed, there was general enlargement of the lymph glands, palpable spleen, and tonsillitis. In both cases the cerebral conditions were present at the onset of the disease, lasted throughout its course, and ended in complete recovery. Their character was that of a simple aseptic meningitis associated with excess of lymphocytes in the spinal fluid, and in one of the cases with an increase in its total protein content. It is not possible to say whether in these cases the cerebral condition and the glandular fever were entirely distinct or whether they were both manifestations of the same infection. The latter view, which is supported by Epstein and Aameshek, is by no means improbable. Glandular fever is obviously a generalised infection, and though it mainly attacks the lymphoid system the appearance of hæmorrhagic nephritis as a complication of some cases shows that it can at times involve other tissues. There seems no reason therefore why the central nervous system should not occasionally be involved.

[1] Acta Med. Scand., 1931, lxxvi., 269.
[2] New Eng. Jour. Med., 1931, ccvi., 1238.

SPECIAL ARTICLES

THE MEDICAL ASPECT OF WINTER HEALTH RESORTS AT HOME.

INQUIRY at coastal resorts in the south and west of England has revealed the presence there this January of many who wintered a year ago on one of the seaboards of France or Italy, in Egypt or Madeira, or still further afield. More intimate inquiry will have revealed further that some at least of them have avowed their intention of not doing so again. The patriotic motive, even should its springs persist, will not carry them through a second winter without the amenities to which they have been accustomed. What is the proportion of these "oncers" it would be convenient to the hotel industry to know; for even this winter things are none too prosperous, as a number of the usual guests have been kept at home by immediate lack of money or anxiety for the future. Unless there is a prospect for the English hotelier of another good winter he naturally hesitates to embark on providing expensive attractions. But unless some attractions are provided the "oncers" will not come again—a rather pretty illustration of a vicious circle and one that formed the unspoken background of the conference (briefly reported in our last issue) just held at Paignton on Torbay. The conference was not strictly a medical one—the chairman stated at the outset that local doctors had taken little part in its organisation—but a number of medical delegates were present, among them county health officers and representatives of the medical advisory committee set up at the meeting held at the Institute of Hygiene on Dec. 9th, 1931, when a statement about winter marine resorts was issued.[1]

The statement referred to the inadequate equipment of many coastal resorts climatically suitable for winter visitors, and this was admitted at the Torbay conference by the recurring emphasis on the need at every resort of something like a winter garden to provide a social meeting place with varied opportunities of healthful recreation. In an impressive letter which was read to the conference Mr. Cyril Maude said it had always appeared to him that those catering for the urban visitors who sought release in salubrious air and lovely surroundings had never properly reckoned with the increased love of good music and entertainment, or with the growth of a democratic desire for a mixing of the classes in the enjoyment of pleasures and recreations He suggested the levy of a tax on visitors which would entitle them to unrestricted use of a central pavilion for this purpose, and several speakers pleaded for the abolition of certain restrictive legislation. But apart from artificial aids of this kind the feeling was expressed that coastal resorts should not omit to make known and accessible the charms of their own hinterland. Especially in the mild climate of Devon and Cornwall is it possible in winter still to enjoy the many natural interests of the countryside which have turned these counties into a summer playground.

Two resolutions were passed at the conference. One urged the immediate formation of a British Coast Resorts Association on the rather ambitious lines enumerated by Sir Humphry Rolleston at a second meeting held at the Institute of Hygiene on Jan. 11th when Lord Riddell presided. This meeting was not itself unanimous on the need for such an association. Its only immediate outcome was to set up another committee to consider the advisability of forming such an association. The other resolution of the Torbay conference, proposed by the town clerk of Penzance, advised coastal municipalities to set up their own local committees consisting of all the elements concerned, including the medical profession. The function of such a committee would be first to try to improve the amenities of the locality, and secondly to collect medical information as to its suitability or otherwise for particular kinds of patients or seekers after health.

This proposal, we are satisfied, is of far-reaching importance. It is almost beyond belief that in any resort which depends largely for its prosperity on a regular influx of winter visitors, many of them weary and infirm if not actually ill, there should be no common meeting-ground of doctors, hoteliers, and municipal officers to consider the best interests of their guests and clients. But so it is. We hold no brief for continental methods, regarding it seemly for our own resorts to develop naturally on their own lines, but there can be no question that, wherever claims are made for any locality of health-giving properties, they should be made, as in all important continental resorts, by a consensus of the local medical fraternity; these should meet to consider how far these claims can be justified by medical knowledge and in what way they can best be honoured, appointing spokesmen to keep their views before a local executive committee. Had there been in each resort such a committee of action, the problems of the present winter might have been squarely faced and appropriate action taken. It is clear that some central association will be needed to codify, collate, coördinate, and distribute the information supplied by such local committees. It may be too late in the present season to develop a complete central association, but something might be done to set up a central organisation to serve the medical interests of the health resorts of the whole country. Certainly it is not too late for every coastal municipality to set its own house in order.

[1] See THE LANCET, 1931, ii., 1373.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

UNDERGRADUATES AND OFFICIAL DUTIES.

THE students' representative councils of the four Scottish universities lately held their annual conference at Edinburgh and were addressed by Sir Thomas Holland, Principal of the University. Sir Thomas said that the student who took no part in the social and athletic activities of his undergraduate body was not worth a degree; but when his share was so great that his academic work definitely suffered he showed a lamentable deficiency in his sense of proportion. For that share he would have to pay a very heavy tax for the rest of his later years. The speaker often worried over the problem of the student who had enforced duties of that kind to carry on. Most forms of recognition of such work would destroy automatically and at once the very value of the experience. The nearest he could imagine to anything like actual

recognition was in his own college in London, where they lived a very simple life and it was possible to make a very simple rule. Certain officials of the Union—which corresponded roughly to a students' representative council—were granted an extra year, free of fees, in order that they might not be forced at once to face the final examinations; and possibly in that way to become forced to accept a second class degree, when otherwise, if free of student activities, they might very well have got a first.

On a proposal (from Aberdeen) that the medical curriculum be extended to six years, Sir Thomas said that the limits were not fixed by mental capacity alone, but by economic considerations. Another year would mean increased cost to the student and would be an added financial burden to the university. Both sides would have to be considered.

THE BIOLOGY OF PARENTHOOD.

Prof. James Ritchie, of Aberdeen, gave as his first lecture in the Farquhar Thomson course one on the Importance of the Child and the Value of Parents. Europe, he said, with less than a fifteenth of the land surface of the earth, contained more than a quarter of the world's population. The world's population itself in 200 years has grown from a mere 500 millions to more than 1700 millions, and the threat of this steady expansion was that in course of time the world would have to exhibit a notice, as Sir Arthur Thomson put it, of "standing room only." He illustrated the problems arising out of the relations of parents and offspring in the ascending groups of the back-boned animals, in which there was an increase and specialisation of parental care.

GLASGOW'S EDUCATIONAL PROVISION FOR MENTAL DEFECTIVES.

In a recent lecture, Dr. Arbuckle Brown, deputy medical officer of health and school medical officer for Glasgow, stated that at present there are almost 1800 children in special schools or classes. Some of lower grade are also receiving instruction, but these are in occupation centres provided by the after-care special schools' committee. The older children from the special schools are given instruction suitable to their after-school life. The boys are drafted to centres for special trades—carpentry, boot-making, iron work, tailoring, and other occupations, both of trade and educational value. The after-care staff undertakes the supervision and encouragement of the children after they left school at 16. The number so cared for is 1300. The staff visit the homes, encourage the young people to find occupations congenial to themselves, or find places for them and maintain supervision till the staff officer is assured that they have become firmly established and are doing useful work. Something like 57 per cent. of the boys were employed, said Dr. Brown, but a lower percentage of the girls. The girls are more useful in domestic work and are often kept at home.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

FREE ADVICE ON MEDICAL PROBLEMS.

In a recent communication to the Academy of Medicine, Dr. R. Dujarric de la Rivière gave a brief account of a new service which has just been started in Paris. This Consultation Publique et Gratuite d'Hygiène is not a dispensary nor polyclinic where treatment is provided. For treatment, it is expressly insisted, patients must go elsewhere. But in the past they have often found it difficult, and sometimes expensive, to find this "elsewhere," and they have not always found it. Or it has not been of the best—an inevitable sequence to the haphazard ways of the past. The new service brings the public health medical officer in direct touch with individual members of the public. Tracts and pamphlets on general hygiene and special subjects are available, but the special feature of this service is not wholesale advice by pamphlets, but individual consultations at which the public health medical officer acts as guide, philosopher and friend to patients and their relatives. It would, perhaps, be misleading to apply to this new service the term "clearing-house," which suggests a highly impersonal machine for sifting morbid material with the help of clerks and secretaries. The service is equipped to give expert advice on the hygiene of housing, food, physical exercises, baths and swimming baths, infant and child welfare, the care of school-children and the aged, the choice of profession, tuberculosis, syphilis, cancer, and alcoholism. Inquirers are told where they can obtain analyses of sputum, &c., what steps to take with regard to disinfection after a contagious disease, where and how they can be vaccinated against typhoid fever and diphtheria, and about the pitfalls of sanitary legislation. It augurs well for the future of this service that its sponsors are very much alive to the importance of its being run by a specialist in public health—not just anyone with a medical degree.

THE PATENTING OF SCIENTIFIC DISCOVERIES.

It will be remembered that a commission was recently appointed by the Academy of Medicine, with Madame Curie as one of its members, to investigate the possibilities and desirability of securing some reward for scientific discoverers by the patenting of their discoveries. Last June Madame Curie drafted a resolution, to which all the other members of the commission subscribed, in which she pleaded the cause of the inventor, urging that protecting his rights would not only be an act of justice to the individual, but would also generally favour the progress of science by aiding laboratories and hospitals and other institutions which serve the public. On Dec. 29th the final conclusion of Madame Curie's draft resolution was adopted at a meeting of the Academy. The text is: "The Academy declares itself in favour of the creation of the rights of the savant and recommends that the recognition of these rights should be hastened by the initiative of the public authorities."

AUSTRALASIA.

(FROM OUR OWN CORRESPONDENT.)

INFANTILE PARALYSIS IN SYDNEY.

THERE are indications that a serious epidemic of infantile paralysis may make its appearance in Sydney during the coming summer. It is not expected to reach its peak until February or March. During the last seven weeks, 52 cases have been reported with nine deaths, and 21 patients are at present under treatment at the Royal Alexandra Hospital for Children. During the epidemic of 1929, there were 241 cases with 29 deaths. In 1930, 30 cases were reported with six deaths. In 1926 a committee was formed in Melbourne with the purpose of assisting in the early diagnosis and treatment of this disease,

and particularly in the collection and distribution of human immune serum. In 1928, a similar committee was set up in Sydney, under the chairmanship of Sir Charles Clubbe, who was instrumental in its formation. This committee is understood to have about 5000 c.cm. of human immune serum available. The results of the use of the serum in the preparalytic stages have been very good.

SHIPS' DOCTORS.

About a year ago public attention was drawn to the fact that a man, who had been taken ill on the passage from New Zealand to Australia, had died because there was no surgeon on board the ship to perform an operation. It was stated, at that time, that as the ship was registered in New Zealand, the matter of making it compulsory for mail steamers to carry doctors rested with the Commonwealth authorities and not with the State Government of the port of arrival. It has now been announced that the Commonwealth Minister for Transport intends to take action to test the application of the Australian Navigation Act to ships registered in New Zealand and trading between the Dominion and Australia. A section of the Act requires that a medical man shall be carried on every ship proceeding on a voyage of more than 650 miles, which has 100 or more passengers on board. Under protest, the company has placed a medical officer on board the ship. It is understood that, in the event of any passenger ship leaving for New Zealand without a medical officer on board, the Commonwealth Government will immediately institute proceedings against the company concerned.

EPIDEMIC DISEASES AT LORD HOWE ISLAND.

Lord Howe Island, a dependency of the State of New South Wales, is a boomerang-shaped island, about seven miles long, lying 450 miles E.N.E. of Sydney. The islanders originate from a party of three white seamen and some Maori women and boys, who reached the island in 1833 and formed the first settlement. Some of the descendants of these pioneers still reside on the island, the total population of which is about 120. They live on the palm industry, which is conducted on a communal plan, so that each islander will get an adequate living. Only two epidemics of infectious disease are known to have occurred, the first being in 1868, when some of the Pitcairn islanders visited Sydney in the schooner *Pacific*, contracted measles on the return journey and were obliged to call at Lord Howe Island, where the disease broke out after their departure. The second, an epidemic of scarlet fever, thought to have been carried there by a tourist, was in 1929–30. The disease was at first not recognised, for there is no medical practitioner on the island, the medical services being rendered by the schoolmaster's wife, who is a trained nurse. A medical man, who was on a visit with a tourist party, was asked to see some of the sick and immediately recognised the disease as scarlet fever. There were 17 cases, one of which proved fatal.

It is of interest that rats were unknown on the island until 1918, when a number made their way ashore from a stranded vessel. They are causing great damage to the palm industry.

VITAL STATISTICS FOR NEW SOUTH WALES, 1930.

The report of the director-general of public health for New South Wales shows that the birth-rate (20·94 per 1000), the general death-rate (8·54 per 1000), and the infantile mortality-rate (49·72 per 1000 births) are the lowest yet recorded in the State. The low death-rate is attributed to the absence of epidemic diseases of the respiratory system and a decline in deaths from diseases of the heart and from cancer. There were increases in the deaths recorded from measles, enteritis, and gastritis in children, and suicide.

THE HOBART PUBLIC HOSPITAL.

A Royal Commission has just been held to inquire into certain irregularities, and to report on the administration, management, and control of the Hobart Public Hospital. In the summary of the conclusions of a scathing report, it is recommended that the present system should be replaced by an honorary system, and that an honorary medical staff should be developed. The position of surgeon superintendent, it is proposed, should be abolished, and a medical superintendent should be appointed to direct the medical services of the hospital, the administration of the institution to be mainly in the hands of the secretary.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

THE MEDICAL REGISTER OF THE IRISH FREE STATE.

A FEW weeks ago a public health authority in the County Dublin appointed as locum tenens medical officer of a dispensary district a man holding the medical degrees of the National University, and at present occupying a position as house surgeon in England. When the appointment was submitted for approval to the Department of Local Government and Public Health, the Minister pointed out that this practitioner's name did not appear in the Medical Register of the Irish Free State, and that, under the Medical Practitioners' Act, 1927, no one could hold an appointment as physician or surgeon in the Irish Free State under any local authority maintained wholly or partly out of the rates unless his name was on the Register of the Irish Free State. It was announced that the practitioner refused to register in the Irish Free State, and consequently the appointment lapsed. It is curious that nearly five years after the establishment of the Register it should still need to be pointed out that practice as a physician or surgeon may be undertaken in the Irish Free State only by those who are on the Medical Register of that dominion.

THE LÜBECK TRIAL.

(FROM OUR BERLIN CORRESPONDENT.)

(*Continued from p. 164.*)

THE PUBLIC PROSECUTOR'S CASE.

THE hearing of witnesses and experts being finished, the public prosecutor began to plead. Nothing in his long legal career had ever, he said, struck him so much as the reading at the beginning of the trial of the names of the 75 infants who died and of the 125 who were injured. Dr. Altstädt, who had introduced the Calmette method, had done so without having had any experience with it in practice and with only some knowledge of the literature. He would not say that he and Prof. Deycke had done intentional injury, but he must maintain that they had acted in a very careless way and should be punished for having caused death and injury by neglect. The Lübeck Senate, relying on Dr. Altstädt as their medical adviser, had not

insisted on consulting the German Health Office before introducing the method in Lübeck. When Dr. Altstädt was asked at the trial whether he did not know that certain physicians in Germany and abroad had warned against an indiscriminate application of B C G he had replied that those physicians were of no importance in the medical world. He (the public prosecutor) must however state that one physician expressing doubt on the harmlessness of a remedy must be heard as much as a hundred others believing in it. Dr. Altstädt's omissions were (1) that he had neglected to ask the opinion of those who had had some experience with B C G, e.g., Prof. Prausnitz; (2) that he had not insisted on having the B C G cultivated in a special laboratory as expressly prescribed by Prof. Calmette; (3) that he had not tested the method in animals before introducing it in patients; (4) that he had not provided for a thorough observation of the infants.

Turning to Prof. Deycke, the public prosecutor said that after it was decided to introduce the Calmette method its danger was further increased by the condition of Prof. Deycke's laboratory. The majority of medical experts had given their opinion that the B C G had not become virulent but that the cultures were contaminated in Lübeck by tubercle bacilli. The question whether B C G might become virulent could not be decided by a law court but only by medical science; in his opinion however the evidence they had heard was sufficient to establish that, in this particular case, a contamination of the cultures had occurred in Prof. Deycke's laboratory. It was not clear whether Prof. Deycke or one of his assistants had made the mistake, but Prof. Deycke must be held responsible for the work done in his laboratory, especially as he had allowed a cultivation of B C G in the same room as other dangerous bacilli. Prof. Klotz must be held guilty because he had not done his duty in observing the infants within and without the hospital. The public prosecutor asked for a verdict of guilty against Dr. Altstädt and Prof. Deycke with a sentence of three years' imprisonment, against Prof. Klotz with a verdict of one year's imprisonment, and a verdict of not guilty in the case of Nurse Schütze, the charge against whom had not been proved.

Counsel for the parents said he did not, on their behalf, make any financial claim against the accused medical men, the Lübeck Senate having agreed to pay for all the damage done by the disaster. Other cities which had sent expressions of sympathy to the city of Lübeck should contribute to the expense because they had been preserved from similar disaster by the Lübeck experience. The negligence of the accused was that they believed that B C G was a virus fixe without considering the opposite views of other medical men. That opinion, though formed bona fide, should not protect them against a charge of manslaughter by neglect and a sentence of imprisonment.

THE WEEKLY RETURN.

IT would be ungenerous not to acknowledge with gratitude the improved format of the Registrar-General's Weekly Return which came into being with the issue for the week ended Jan. 9th. It is just ten years since any change was made; the cover remains unaltered, but there are within many changes in type and arrangement which will make the return readier for reference, although at the moment any change may be found a little perplexing. The figures are now based on the existence of 117 instead of 107 great towns. The chief addition is to be seen in two new tables on page 3, one of which gives the annual death-rates in four recent weeks for London and 12 representative great towns as well as for the whole 117 great towns, and for six grouped areas. The other is a new table of total notifications of four principal infectious diseases showing their actual number and the expected number based on the median value of the corresponding weeks of 1923–31. From this table it will be seen at a glance that in the week ended Jan. 16th the notifications for scarlet fever, diphtheria, and enteric fever in England and Wales were 16, 14, and 16 per cent. respectively below expectation, whereas for primary pneumonia they were 44 per cent. in excess of expectation. Table 3A is another small addition giving corrected totals for England and Wales of notifications of infectious disease for the previous week, together with returns too late for inclusion in Table 3. In Table 3 itself the number of notifications for the administrative county are now given in cases where the population of county boroughs has to be deducted from that of the geographical county. Moreover, for the first time, municipal boroughs are distinguished from urban districts—a great convenience. One table has been allowed to drop out altogether; but as it has long had an archaic flavour it will not be missed except by the seeker after abstruse knowledge who wanted to know the number of stillbirths in Warsaw or the deaths from whooping-cough in Rio de Janeiro. The price of the Weekly Return remains unaltered at sixpence, and we commend it once again to the continuous study of all whose duty or hobby it is to form an accurate idea of the current health of the country.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 16TH, 1932.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 68 (last week 68); scarlet fever, 1493; diphtheria, 956; enteric fever, 27; pneumonia, 2210; puerperal fever, 44; puerperal pyrexia, 120; cerebro-spinal fever, 50; acute poliomyelitis, 4; encephalitis lethargica, 14; dysentery, 21; ophthalmia neonatorum, 94. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Jan. 19th–20th was as follows: Small-pox, 133 under treatment, 2 under observation (last week 115 and 2 respectively); scarlet fever, 1223; diphtheria, 1452; enteric fever, 7; measles, 758; whooping-cough, 360; puerperal fever, 17 (plus 11 babies); encephalitis lethargica, 225; poliomyelitis, 2; "other diseases," 288. At St. Margaret's Hospital there were 22 babies (plus 13 mothers) with ophthalmia neonatorum.

Deaths.—In the 117 great towns, including London, there were no deaths from small-pox, 2 (0) from enteric fever, 53 (22) from measles, 10 (2) from scarlet fever, 46 (10) from whooping-cough, 33 (7) from diphtheria, 56 (12) from diarrhœa and enteritis under two years, and 412 (145) from influenza. The figures in parentheses are those for London itself.

The fatal cases of enteric fever occurred at Eastbourne and Sunderland. Ten deaths from measles were reported from Stoke-on-Trent, 4 from Manchester, 3 each from Portsmouth and Bolton. Birmingham reported 10 deaths from whooping-cough, Liverpool 7. Of deaths attributed to influenza Birmingham stood highest with 17, followed by Manchester 14, West Ham 12, and Bradford 11.

The number of stillbirths notified during the week was 284 (corresponding to a rate of 42 per 1000 births), including 51 in London.

CORRESPONDENCE

TUBAL PREGNANCY.

To the Editor of THE LANCET.

SIR,—Were it not for the fact that Prof. Blair Bell likes to feel that he is not as other gynæcologists, one would feel inclined to let his letter on Mr. Tanner's reported case of tubal gestation lie on the table as a post-prandial red herring, rather than reply to what is undoubtedly meant to be an educational essay. As Prof. Blair Bell has given expression to an opinion on Mr. Tanner's treatment of his case which would be shared by few, if any, gynæcologists of standing, I hope he will not mind answering the following questions.

1. Is it sound surgery to conserve a tube in which a tubal pregnancy has occurred, when the great probability is that this tube was abnormal before the pregnancy (as is generally believed), and will be even less normal after it has been damaged by the pregnancy?

2. What guarantee is there that active chorionic tissue will not be left in the tube, to cause further erosion, as is known to have occurred when the intestine has had villi implanted on its surface after a tubal rupture or abortion?

3. What guarantee is there that large vessels ruptured in the tube wall, or even raw edges will not continue to bleed if adequate control of the hæmorrhage is not secured by removal of the tube?

One cannot help feeling that if Prof. Blair Bell will but visualise what he has seen and had to contend with in these cases, he will modify the views he has expressed.—I am, Sir, yours faithfully,

AUBREY GOODWIN.

Queen Anne-street, W., Jan. 25th, 1932.

To the Editor of THE LANCET.

SIR,—With regard to Prof. Blair Bell's letter in your last issue, I did not suggest that the colouration of the umbilicus was unknown but that it was rare. In personal letters, Dr. J. A. Ryle and Prof. Miles H. Phillips refer me to a similar case reported by T. S. Cullen in Volume I. of "Contributions to Medical and Biological Research," New York, 1919, published in honour of Osler on his seventieth birthday. Prof. Phillips says in his letter:

> "Although I have never seen bluish discolouration of the umbilicus, I have been on the look out for it ever since Mr. Cullen of Baltimore drew attention to it as a diagnostic sign."

Prof. Blair Bell criticises removal of the ampullary portion of the ruptured tube containing the pregnancy. This was done because it was the only quick and safe way of arresting hæmorrhage which had filled the abdomen with blood. Quite apart from the loss of time, removing the pregnancy alone is attended with the risk of leaving behind chorionic villi which might erode the tube or other structures such as the omentum or intestine and cause fresh hæmorrhage. Further, I suggest that such a damaged tube, if it functions again, may give rise to a second ectopic pregnancy.

Both ovaries and the left tube remained after the operation, so that my procedure was not drastic. I hope the patient does not have an ectopic pregnancy in the left tube—an event I have met with on several occasions.—I am, Sir, yours faithfully,

W. E. TANNER.

Queen Anne-street, W., Jan. 23rd, 1932.

BRILLIANT GREEN FOR SYCOSIS.

To the Editor of THE LANCET.

SIR,—Your annotation on this subject will be read with much interest. I should, however, like to state that in my hands, and in those who have adopted my plan or method, the treatment of coccigenic sycosis is neither intractable nor prolonged. Another fallacy is that this form of sycosis is liable to recur after it has been properly cured. In my experience the cure remains permanent. But, as the whole process of the disease is under complete control by correct applications, sufferers have no anxiety. The alcoholic treatment has been advocated and carried out by me during many years. Alcohol is the chief active agent in the antiseptic use of tincture of iodine, picric acid, and largely in Prof. Senin's use of brilliant green as it is in mine. One can hardly understand anyone applying disfiguring pigments to the face when pleasanter methods are available. Alcohol is a mild flocculent of proteins, either of the skin tissues or of the organisms with which it may be infected. Further, it is a powerful dehydrator, a quality highly prejudicial to the vitality of the cutaneous flora. These two activities make it the ideal antiseptic for the skin, to which it can be applied frequently without injury. Its value in sycosis depends entirely upon the oft-repeated statement of Sabouraud—that sycotic abscesses are comparatively superficial. Thus they can be reached by readily diffusible and volatile liquids.

The details of the method I adopt and advise will be found in a paper I read before the then called London Dermatological Society and later published under the title of Some Auto-infections (*Clinical Journal*, March 9th, 1921, pp. 145–150). The matter has been recently communicated to the *Dermatologische Wochenschrift* (1930, xci., 1873).

I am, Sir, yours faithfully,

Wigan, Jan. 23rd, 1932. R. PROSSER WHITE.

VACCINE TREATMENT IN INFECTIVE ARTHRITIS.

To the Editor of THE LANCET.

SIR,—In her interesting communication on this subject in your last issue (p. 178) Dr. Phyllis Congdon draws no distinction between the cases treated with stock and autogenous vaccines respectively and the proportion of each group is not given. As no details are given as to bacteriological tests of the patients on admission, it would appear that the diagnosis of *infective* arthritis was made on clinical grounds only. Furthermore, as the stock vaccine employed contained no fewer than 40 strains of streptococci, the dose of any microbe that might be present in the system of the particular patient would be very small indeed. And as it was only prepared once a year the probability is that, by the time it was received by some patients, much of its original potency would have been lost. Many pathologists would not expect a stock vaccine of this type to be very useful. Dr. Congdon gives only the initial dose of any vaccine; the dose attained is also of importance. Only streptococci are mentioned. The fact that dual or multiple infection is commonly present in arthritis is an important factor in its vaccine therapy.

I submit therefore that, even within the limits of her inquiry, the conclusion that "vaccines do not

appear to hold out any better prospect of improvement or cure of infective arthritis than the other methods of treatment in use" is not justified by the evidence given. It has little or no bearing on the value of autogenous vaccine therapy based on complete bacteriological examination of each individual patient.

I am, Sir, yours faithfully,

A. KNYVETT GORDON.

Bedford-square, W.C., Jan. 23rd, 1932.

FILLING UP A DEATH CERTIFICATE.

To the Editor of THE LANCET.

SIR,—As a medical officer of health I have to scan the weekly returns of deaths sent to me by the local registrars, the causes of death being compiled from the death certificates furnished by medical practitioners. Judging by the returns which come to my notice, it would appear that doctors have difficulty in allocating the causes of death as between primary and secondary causes. In this respect there seems to be no difference between those recently qualified and those who have been in practice many years. It should not be difficult to fill up a death certificate correctly if it is borne in mind that what is meant by a "primary" cause of death is the disease, present at the time of death, *which initiated the train of events leading thereto*, and not a mere secondary, contributory, or immediate cause, or a terminal condition or mode of death.

Here are a few instances of gross error which have come to my notice:—

1. Primary cause, cardiac failure. Secondary, aortic disease.
2. Primary cause, hæmatemesis. Secondary, cancer of stomach.
3. Primary cause, exhaustion. Secondary, cancer of bladder.
4. Primary cause, heart failure. Secondary, cancer of breast.
5. Primary cause, exhaustion. Secondary, pulmonary tuberculosis.

I could continue this list indefinitely, but I think I have made it clear that more attention should be paid to teaching the medical student the right way to fill up a death certificate, and I hope the teachers of public health and administration will make a note of this if they have done me the honour to read my letter.

I am, Sir, yours faithfully,

A. B. DUNNE, M.B. Camb.

Doncaster, Jan. 22nd, 1932.

ERYTHROCYTE SEDIMENTATION TEST.

To the Editor of THE LANCET.

SIR,—An annotation in your issue of Jan. 9th refers to the erythrocyte sedimentation test as an index of the activity of rheumatic infection. I have performed this test in some thousands of cases since Fahraeus sent me a copy of his book in 1922, and readings are given in all those reported in my three volumes of the "Nature of Disease" wherein also the rationale of the test is described. My conclusion is that, as rapid sinking of the red blood corpuscles runs pari passu with active dehydration of the protein particles, and as this chemico-physical change may be brought about by physical agents, chemical poisons, and micro-organisms, the test has no specific value and cannot be employed to determine if a particular organ in the body is being attacked by the invader responsible for the dehydration. Nor can it be used to ascertain when the invader ceases to be active, first, because continued activity tends to cause hydration, and secondly, because months may elapse after the invader has vanished before the reading becomes normal. Hydration checks the sedimentation of the red blood corpuscles. The test depends primarily upon the chemico-physical state in which the protein particles of the plasma happen to be and not upon the number of the red blood corpuscles or the protein content of the plasma. The suspension stability of the red blood corpuscles is reduced only in those cases of anæmia where the protein particles are being subjected to dehydration, the state in which the red blood corpuscles happen to be does not influence it. In aplastic anæmia the sedimentation rate is not increased, and in pernicious anæmia where it is the red blood corpuscles do not fall so fast as they do in streptococcic septicæmia, except just before death.

I am, Sir, yours faithfully,

J. E. R. MCDONAGH.

Wimpole-street, W., Jan. 21st, 1932.

THE MIND IN TUBERCLE.

To the Editor of THE LANCET.

SIR,—In the paper by Dr. Andrew Morland with this title in your last issue (p. 176), I am particularly interested in his reference to the work of Dr. H. Banister at Papworth. Impressed by the lack of treatment in sanatoria on the psychological side, I was fortunate, some years ago, in securing the services of Dr. Banister, who is lecturer in experimental psychology at Cambridge, and whose work in our psychological clinic has been of great benefit to certain of our patients. I am convinced that Dr. Morland is right when he states:

"In this struggle between health and disease the mind plays an important part, and I believe that further understanding of the mechanism by which the mind responds to the stimulus of the disease would enable more rational and effective treatment to be applied."

Dr. Banister, whose experience in the teaching of psychology to medical students in Cambridge is considerable, would, I am sure, agree with me that a knowledge of psychology is of the utmost importance to those whose work lies in the tuberculosis field, and as Dr. Morland so well puts it: "If the tuberculosis physician could learn so to influence the minds of his patients that they acquired a proper attitude towards the disease, the greatest therapeutic advance of the century would have been achieved."

I am, Sir, yours faithfully,

PENDRILL VARRIER-JONES.

Papworth Hall, Cambridge, Jan. 23rd, 1932.

RUPTURE OF THE ADDUCTOR LONGUS.

To the Editor of THE LANCET.

SIR,—In his Robert Jones Essay on injuries of tendons and muscles, Mr. H. C. Edwards deprecates (THE LANCET, Jan. 9th, p. 70) immediate operative treatment of rupture of the adductor longus. This leads me to record the following case. A rupture of the adductor longus was sustained while playing polo. The gap in the muscle was easily palpable, being rather more than two fingers' breadth in extent. Operation was carried out on the following day, and the lesion, which was situated below the pubic attachment, retained by suture. Apart from three weeks' rest in bed no after-treatment was carried out. The injury was sustained in May, in August horse exercise was resumed, and in October racing and polo.

I am, Sir, yours faithfully,

Berlin, Jan. 21st, 1932. LAURENCE O'SHAUGHNESSY.

THE PREVENTION OF DEAFNESS.

To the Editor of THE LANCET.

SIR,—In Dr. Sorsby's paper in your issue of Jan. 16th there is an allusion to the Zünd-Burguet treatment which is neither fair nor correct. Dr. Sorsby says that in treatment "the many efforts, such as the Zünd-Burguet apparatus, which aim at re-education, are of no value." A perusal of my handbook on the electrophonoïde method or any of my published cases would have made Dr. Sorsby hesitate before making so sweeping a statement. The following cases of deaf children are selected because they have now kept their improvement for at least four (in some five) years after being pronounced "incurable" by reputable otologists.

1. Boy, 10; catarrhal deafness. Whisper, 14 in. before; 17 ft. after treatment.
2. Boy, 8; also catarrhal. Voice before treatment, 30 in.; after, 17 ft.
3. Boy, 8; catarrh following measles, with concomitant signs of commencing internal ear deafness. Whisper, 45 in. before; 15 ft. after treatment.
4. Boy, 7; toxic deafness; internal ear type; after septic wound of leg. Voice before treatment, 15 in.; after treatment, 15 ft.

These children were all ordered for deaf-schools, and are now doing well at different well-known public schools. A fifth boy, whose hearing was reduced by post-suppurative processes to R. 1 ft., L. 3 ft., was improved by 5 ft. and 10 ft.

Dr. Kerr Love and I have for nearly 30 years preached consistently the prevention of deafness, and it is a great satisfaction to us that our lead is now being followed by a younger generation. To me, personally, it is a matter of pride that what Dr. Sorsby says in his paper confirms a great deal of what I stated in THE LANCET in 1912, the *British Journal of Children's Diseases* in the same year, the *Eugenics Review* in 1914, the *Practitioner* for 1915, and the *Journal of Laryngology* in 1917.

I am, Sir, yours faithfully,

MACLEOD YEARSLEY.

Harley-street, W., Jan. 20th, 1932.

CANCER OF THE LUNG.

To the Editor of THE LANCET.

SIR,—Among the annotations in your last issue I see one on primary carcinoma of the lung, in which I note the following observation: "If more space in the literature on bronchial carcinoma were given to diagnosis, especially early diagnosis, and less on histogenesis and metastases, the average medical reader would be grateful." There follows an account of recent clinical observations by Dr. B. M. Fried which are described as adding one new idea of importance. The writer of the annotation does not appear to be aware of the prominence given to this very aspect of the subject in Dr. Maurice Davidson's book on "Cancer of the Lung," to which, unfortunately, no reference is made. Apart from the fact that it is the only book on this subject that has been published in the English language, and that it deals with the subject mainly from the clinical and diagnostic point of view the omission, if I may say so, seems to me the more surprising since I note the volume was reviewed by THE LANCET on Nov. 15th, 1930. In view of the appeal in this annotation for practical information to meet the demands of the average medical reader, I do feel that attention should be drawn to a standard work on the subject in question.

I am, Sir, yours faithfully,

Harley-street, W., Jan. 24th, 1932. PHILIP ELLMAN.

NEMBUTAL AND CHLORAL IN CHILDBIRTH.

To the Editor of THE LANCET.

SIR,—With reference to the paper in your issue of Jan. 16th by Drs. O'Sullivan and Craner on the use of nembutal and chloral in 60 cases of childbirth at the London Hospital, I would like to make a few confirmatory statements. I have given nembutal (alone) to 18 of my parturition cases with most pleasing results. I was giving three ampoules, but now give four (easily swallowed by most patients) when the os is three-fifths dilated, or when labour is obviously in the second stage. Within 15 to 30 minutes the patient is asleep between the pains; she groans during pains, which are not lessened in frequency nor strength; in fact, in the case of two very nervous patients, my sister-in-charge of the maternity ward and I thought that the pains became more powerful under the nembutal. Labour progresses normally, and the child cries lustily when born. The patient usually sleeps for five or six hours after the child is born, and has no memory of the birth. One of my earliest cases under nembutal very greatly impressed us; when asked next day how she felt after taking the drug, and whether she had pain, she said she felt no pain, but she "felt stronger and could feel the child coming down and out." In two cases of unreduced occipito-posterior presentation and one case where the head remained transverse, ether was used while I rotated the head, and extracted with forceps, and less anæsthetic was needed than if nembutal had not been given. The puerperium in all these cases has been normal, and children healthy. It appears to me that in nembutal we have a drug which should help the general practitioner, and be of great comfort to all women in childbirth.

I am, Sir, yours faithfully,

J. W. LANE,

Major, R.A.M.C.; Officer Commanding, Military Families' Hospital.

Hilsea, Jan. 26th, 1932.

MODERN HOSPITAL CONSTRUCTION.

To the Editor of THE LANCET.

SIR,—I was glad to see your comments on modern hospital construction in a leading article last week. The sanitary tower with cross-ventilated lobby was not an unmixed blessing; too often the cross ventilation was too much for the patients and staff, and the multiplicity of doors was a nuisance to the nurses carrying bed-pans to the sink room.

The experiments in balcony construction which you describe in French and German hospitals are most interesting, but the continuous balcony in front of ward windows is costly to construct, and except in special cases not always a success in the English climate. I found when visiting a well-known sanatorium in the south of England recently that the patients were not allowed by the medical staff to lie out in the sun, and the balconies were therefore of very little use. The proportion of window to wall space in the ward also requires careful consideration. The feeling of comfort and protection so important to a sick person may be lost if the ward is designed like a glass box, though large windows to the south are nearly always an advantage.

When I was a patient in a hospital during the war I was amused at the continual struggle that went on between the staff and the patients with regard to the open window. We must try to bear in mind that a draught may cause a patient intense annoyance, and

as far as possible a ward should be planned to give each patient a window so that the ventilation can be arranged to suit individual cases.

I am, Sir, yours faithfully,

L. G. PEARSON, F.R.I.B.A.

Knightsbridge, S.W., Jan. 26th, 1932.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt.-Comdrs. V. F. Walsh, to *Bideford*; and W. P. E. McIntyre to *President*, for Medical Dept., Admiralty.

Surg. Lts. T. B. Lynagh to *Hastings*, C. H. Birt to *Victory*, for R.M. Infirmary, Portsmouth, and G. D. J. Ball to *Vindictive*.

ROYAL ARMY MEDICAL CORPS.

R. E. Gordon is granted a temp. commn. in the rank of Lt.

TERRITORIAL ARMY.

R. Woodside (late Offr. Cadet, Glasgow Univ. Contgt., Sen. Div., O.T.C.) to be Lt.

ROYAL AIR FORCE.

P. J. C. Keane is granted a non-permanent commission as a Flying Officer.

DEATHS IN THE SERVICES.

Surg.-Gen. Sir Henry Hamilton, K.C.B., I.M.S. (retd.), who died on Jan. 22nd at the age of 81, was the son of William Hamilton, of Coolaghey House, Raphoe, Co. Donegal, and was educated at Royal School in that town. Subsequently he entered the Royal University of Ireland, and in 1875 graduated at Queen's College, Belfast, in medicine and surgery. In the following year he entered the I.M.S., and in 1878–80 took part in Roberts' march from Kabul to Kandahar, and was at the battle of the latter place (mentioned in despatches); he was also senior medical officer to General Gatacre's brigade in the Relief of Chitral Expedition, and held a similar office in the operations in connexion with the Frontier risings of 1897–98 (mentioned in despatches and promoted Brigade Surg. Lt.-Col.). In the Boxer Expedition, 1900–1901, he was principal medical officer in charge of No. 2 General Hospital. He received the C.B. in 1904, and was promoted to K.C.B. in 1913.

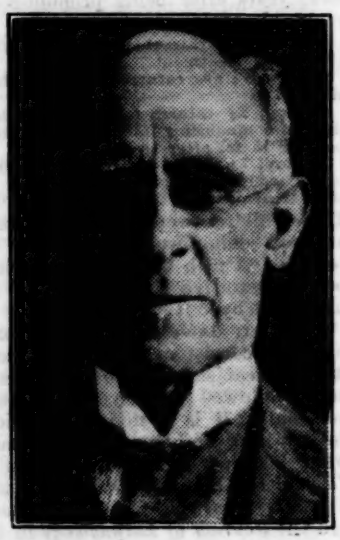
Major-General Harold Hendley, C.S.I., I.M.S. retd., who died on Jan. 21st at the Thatched House, Caxton, Cambridge, in the seventy-first year of his age, was the son of the late T. Hendley, and received his early education at St. John's College, Hurstpierpoint. Later he studied medicine at St. Bartholomew's Hospital, and qualified with the M.R.C.S. Eng. in 1882. He entered the I.M.S. two years later, having in the meantime taken the L.S.A. At Netley he was Director-General's prizeman in pathology. He saw active service almost immediately, for he commanded the field hospital with the Suakin Expeditionary Force in 1885 (medal and Khedive's star), while in 1886–87 he was medical officer to the 7th Bengal Cavalry with the Burma Field Force (medal and clasp). Successively civil surgeon in the Punjab and at Simla he afterwards became medical adviser, Patiala State, and was D.D.M.S. in India from 1911 to 1915, in which latter year he officiated as D.M.S. Afterwards he acted as Inspector-General of Civil Hospitals and Sanitary Commissioner, and he was a member of the Legislative Chamber, Punjab. In 1917 he was acting D.G., I.M.S., and in the following year D.D.M.S. 4th (Quetta) Division, and Baluchistan Field Force (medal and clasp, and mentioned in despatches). He was awarded the C.S.I. in 1920. Major-General Hendley, who was a graduate of Durham, was an honorary surgeon to the King and an hon. associate of the Order of St. John of Jerusalem.

DONATIONS AND BEQUESTS.—The late Mrs. Matilda Helen Stewart Forbes Murray Rezin, of Old Aberdeen, among other bequests left £2000 to the Aberdeen Royal Infirmary for the endowment of a "Matilda Murray Bed"; £2000 to the Royal Aberdeen Hospital for Sick Children, for the endowment of a "Matilda Murray Bed"; £2000 to the University of Aberdeen, to endow a bursary or bursaries for students in the Faculty of Science; £500 each to the Aberdeen Asylum for the Blind, and the Morningfield Hospital, Aberdeen; £400 to the Aberdeen Dispensary and Vaccine Institution.—An anonymous donor has offered to provide £61,500 towards the cost of a new infectious diseases hospital for Wakefield.

OBITUARY

ROBERT HENRY TODD, M.D. Dub., F.R.C.S. Irel.

Dr. Robert Todd, who died on Dec. 14th, at the age of 72, shortly after his return to Australia from England, will be remembered chiefly for his outstanding service in the organisation of the British Medical Association in Australia, and especially in New South Wales. He was born in London in Burlington-street, where his father, Dr. Armstrong Todd, was in practice. From schooling at Christ's Hospital he proceeded to Hertford College, Oxford, and thence to Dublin, where he graduated, and also took the diploma of State medicine in 1886. After gaining his Irish Fellowship in the following year he married, went out to Australia, and set up in practice at Maclean, Clarence River. An old injury to his wrist made it difficult, however, for him to carry on his work, and later he relinquished it and went to Sydney, where he graduated as LL.B., and was admitted to the Bar in 1894. After this he held a number of city appointments, including that of city coroner. In 1906 he was elected a member of the Council of the New South Wales Branch of the British Medical Association, and from 1908 was honorary secretary of the branch, to which he gave almost the whole of his time until April of last year. He also acted as honorary secretary for the British Medical Association in Australia, and for his signal services was in 1923 presented with a gold medal. He was associated with the University of Sydney for 20 years as lecturer in medical jurisprudence and in the ethics of medical practice.



DR. R. H. TODD.

Among many other activities Dr. Todd was honorary secretary of the Sydney Amateur Orchestra, and was a member of the Taronga Park Trust (the Sydney zoological gardens), in which he was keenly interested, and to which he rendered valuable service. A man of great, untiring energy and kindly disposition, he was widely known and esteemed, and his helpfulness was especially manifested to the younger members of the profession who sought his advice and guidance.

EDWIN HYLA GREVES, M.D.Edin., F.R.C.P.Lond.

THE death of Dr. Hyla Greves on Jan. 12th leaves a gap in the Bournemouth medical circle which may be hard to fill. Dr. Greves was educated at Shrewsbury and Edinburgh University, and had already made his mark at Liverpool as pathologist to the

Royal Infirmary and physician to the Children's Infirmary when he was sent to the south coast with a diagnosis of general miliary tuberculosis and a few months to live. Fortunately he had the will to recover, and his experience of tubercle in his own person made his advice doubly valuable both to his patients and to his professional colleagues. He became physician to the Royal National Sanatorium at Bournemouth, and referee to the National Hospital for Consumption at Ventnor; whilst he held appointments of a more general character at the Lymington and District Cottage Hospital and the Swanage Convalescent Home for Children. His practice carried him widely through the four counties of Hampshire, Dorset, Wilts, and Somerset, and it was characteristic of him that at 75 years of age he was still meeting the large physical demands made on him by a wise economy of time, while in the presence of real illness or distress of mind it is on record that his charm and kindliness knew no bounds. He had long been the senior member of the profession in Bournemouth, and his colleagues recognised in him a born teacher, one with whom it was impossible to be for even a few minutes without learning something. A member of the College of Physicians by examination in 1889, he was honoured 33 years later by election to the Fellowship.

He is survived by his widow, a son and three daughters.

MEDICAL NEWS

University of Oxford.

An examination for a *Radcliffe Travelling Fellowship* of the annual value of £300, and tenable for two years, will begin at the University Museum on Feb. 23rd.

Candidates must have passed all the examinations required for the degrees of B.A. and B.M., and must not have exceeded four years from the time of passing the last examination required for the B.M. degree. The successful candidate must declare that he intends to devote himself during his tenure of the Fellowship to the study of medical science and to travel abroad with a view to that study. In the examination, papers will be set in physiology, pathology, and preventive medicine, and a subject will be proposed for an essay. There will also be a practical examination in pathology. Candidates may offer in addition a special branch of either medicine or surgery. Application must be made in proper form to the Regius professor of medicine by Feb. 10th.

The *George Herbert Hunt Travelling Scholarship* is awarded without examination every second year to a graduate in medicine of the University (of either sex) who has not exceeded five years from the date of passing the final examination for the degree of B.M.

The scholarship is of the value of £100, or such smaller sum as two years of the income of the Fund provides. Candidates must undertake to travel abroad for a period of not less than three months for the purpose of clinical study or research in medicine. Preference is given to those who express an intention of becoming surgeons or general practitioners. The next election will be made in April, 1932, and candidates must send their applications to the Dean of the Medical School on or before Feb. 23rd.

Schorstein Research Fellowship in Medical Science.—The board of the Faculty of Medicine is prepared to make an election to this Fellowship in June, 1932. The board has power, if in special circumstances it shall seem desirable, to divide the Fellowship into two Studentships.

The Fellowship, which may be divided into two studentships, which will be of the value of £200, will be tenable for two years from Oct. 1st, 1932, in any of the medical departments at Oxford. Candidates must be graduate members of the University, holding a registrable medical qualification, and must be under 35 years of age on Oct. 1st. Application must be made in proper form to the Dean of the Medical School, not later than May 2nd.

University of Glasgow.

The *Harry Stewart Hutchison Prize* of the value of about £50, for the best writing or writings embodying original research work in a branch of medical science relating to children, will be awarded in 1933. Medical graduates (of not more than ten years' standing from their first graduation in medicine) of all British, home, and colonial universities, may be competitors. Particulars will be found in our advertisement columns.

University of London.

A ceremony for the installation of the new Chancellor, the Earl of Athlone, K.G., and for the conferment on him of the honorary degree of Doctor of Laws, will be held at the University of London on Feb. 18th, at 8.30 for 9 P.M. Members of Convocation who desire to be present are asked to communicate with the Clerk of Convocation at the University of London, South Kensington, at latest by Feb. 4th. If it is found impossible to accommodate all applicants, invitations will be issued according to priority of application.

At a meeting of the Senate on Jan. 20th the title of professor of biochemistry was conferred on Mr. Robert Robison, D.Sc., F.R.S., of the Lister Institute; and the title of reader in biochemistry on Mr. J. M. Gulland, D.Sc., and Mr. William Robson, D.Sc., of the Lister Institute and King's College respectively.

The Osler Club.

At a meeting of this club held in London on Jan. 22nd, Mr. S. J. L. Taylor read a paper on Samuel Pepys and Medicine, and Dr. W. R. Bett made a short communication on Viktor Hensen, who in 1856 discovered the glycogenic function of the liver independently of Claude Bernard.

Royal London Ophthalmic Hospital.

The annual dinner of past and present students of this hospital will be held at the Langham Hotel, Portland-place, on Thursday, Feb. 11th, at 7 for 7.30 P.M., with Sir William Lister in the chair. Application for tickets should be made to Mr. Rupert Scott, 70, Harley-street, W.1.

Pharmaceutical Society of Great Britain.

At a meeting to be held at 17, Bloomsbury-square, W.C., at 8.30 P.M, on Tuesday, Feb. 9th, Dr. H. E. Archer will speak on Biochemistry, Chemical Pathology, and Pharmacy.

National Hospital, Queen-square.

Post-graduate lectures and courses are now beginning at this hospital, and will continue until the middle of March. Particulars may be had from the Dean of the Medical School.

The Duke of Connaught and St. Thomas's Hospital.

On Jan. 18th the Duke of Connaught completed half a century as President of St. Thomas's Hospital.

Glasgow Victoria Infirmary Deficit.

A deficit of £26,748 is reported upon the last year's working. Since the paying patients' ward of 32 beds was opened nine months ago it has been fully occupied, and more than 500 cases have been treated.

Billericay Public Assistance Hospital.

An extension of this Essex hospital was opened last week. The cost has been £4000, and there are now 70 beds and accommodation for a staff of 40.

Village Settlement for Cripples.

On Friday last week Prince George visited Shropshire and laid the foundation-stone of the Derwen Cripples' Village Settlement at Gobowen, and opened the Cripples' Training College. He afterwards laid another foundation-stone to commemorate the reconstruction of the Shropshire Orthopædic Hospital adjoining. Beginning at Baschurch 31 years ago with three crippled boys and one crippled girl, the work of the hospital and training college has increased until it covers the counties of Salop, Hereford, Chester, Denbigh, Flint, Montgomery, Radnor, and Merioneth. The hospital now has 320 beds; its trained orthopædic nurses are working in many parts of the country and abroad; its after-care department has charge of between 4000 and 5000 cases, and has 34 orthopædic clinics scattered over the eight counties mentioned.

Fellowship of Medicine and Post-Graduate Medical Association.

Arrangements for next week will be found in our Medical Diary. Forthcoming special courses include one on antenatal treatment, to be given by Dame Louise McIlroy at the Royal Free Hospital, on Fridays at 5 P.M.; one on diseases of the chest at the Brompton Hospital, all day from Feb. 8th to 13th; one on medicine, surgery, and the specialties, at the Prince of Wales's Hospital, Tottenham, all day from Feb. 15th to 27th; and one on clinical surgery, at the Royal Albert Dock Hospital on Saturdays and Sundays for two week-ends, Feb. 20th–21st and 27th–28th. An evening course for the M.R.C.P. examination, including six clinical and two pathological evenings, four lectures, two ophthalmic demonstrations, and one laboratory demonstration, will be held from Feb. 22nd to March 18th. Syllabuses may be had from the Fellowship at 1, Wimpole-street, London, W.1.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Feb. 2nd.—5.30 P.M., ORTHOPÆDICS. (Cases at 4.30 P.M.) Cases: Mr. P. B. Roth: 1. Bone Graft of Radius in a Child. Mr. W. H. Ogilvie: 2. Osteomyelitis of the Pubis. Mr. R. Marnham (for Mr. E. P. Brockman): 3. Case for Diagnosis. Mr. Alan Todd: 4. Non-union of Upper Epiphysis of Femur in a Child. Mr. B. H. Burns: 5. Case for Diagnosis. 8 P.M., PATHOLOGY. Laboratory Meeting at the Pathological Department, Cancer Hospital, S.W. Communication: A. Piney: Blood Changes in Chronic Myeloid Leukæmia after Irradiation. Communications and Demonstrations: A. Piney: Megakaryocytes in the Peripheral Blood. 2. Blood Films from Case of Acute Aleukæmic Lymphadenosis. 3. Adamantinoma of Pituitary. Miss L. M. Hawksley: Adamantinoma of Tibia. W. V. Mayneord and I. Hieger: 5. Fluorescence of Cancer-producing Pitch Fractions and Hydrocarbons. Cancers Produced by 1:2:5:6-dibenzanthracene. J. W. Cook: 5:6-cyclo Pentene-1:2-benzanthracene, a new Cancer-producing hydrocarbon. Harold Burrows: 7. Localisation of Colloidal Dyes. Miss Barry: 8. Experimental Production of Sarcoma. J. M. Woodburn Morison: 9. Radiograms.

WEDNESDAY.—5 P.M., HISTORY OF MEDICINE. Papers: Dr. J. F. Halls Dally: Milestones in the History of Blood Pressure. Dr. Dan McKenzie: Alfred Higginson and the Enema Syringe (illustrated by slides and exhibits). 8.30 P.M., MEDICINE, SURGERY. Special discussion on Diagnosis and Treatment of Abscess of the Lung. Openers: Dr. R. A. Young and Dr. James Maxwell, Medicine; Mr. J. B. Hunter, Dr. Peter Kerley, and Mr. V. E. Negus, Surgery. Other speakers will take part.

THURSDAY.—8 P.M., TROPICAL DISEASES AND PARASITOLOGY. Laboratory meeting at the London School of Hygiene and Tropical Medicine, Keppel-street, London, W.C. Exhibits: Dr. Crowden: 1. The Measurement of Skin Temperature and Radiation by Means of the Moll Thermopile. 2. The Katto High Temperature Thermometer for Use in the Tropics. 3. The Early Detection and Measurement of Deafness in School-children. Mr. Leeson: 4. Specimens Illustrating the Life History and Method of Breeding of the Bug, *Rhodnius prolixus*, the Vector of American Trypanosomiasis. Dr. Duncan: 5. Fungi Causing Mycetoma. Prof. J. G. Thomson: 6. Animal Experiments on the Effect of Relapsing Fever on Trypanosomiasis (*T. rhodesiense*). Dr. Newham: 7. Specimens from the Museum of the London School of Hygiene and Tropical Medicine. Dr. V. B. Wigglesworth: 8. The Effect of Oil on the Tracheal System of the Mosquito Larva. Dr. Andrew Robertson: 9. *Ditrichomonas ovis* nov. sp. Found in the Gut of a Sheep. Major Edge: 10. Vital Records in Tropical Countries. Dr. N. Hamilton Fairley and Dr. P. Manson-Bahr: 11. Post-mortem Specimen of Multiple Amœbic Abscess Involving Right Half of Liver with Compensatory Hypertrophy of Left Half. Exhibits by the staff of the Department of Helminthology of the School.

FRIDAY.—10 A.M., OTOLOGY. Papers: Mr. W. S. Thacker Neville: Aural Vertigo. Mr. J. S. Fraser: The Pathology of Deaf-mutism (with lantern slides). Dr. Kerr Love: Towards the Prevention of Deaf-mutism—a Review of Forty Years' Progress. Other speakers: Mr. F. W. Watkyn-Thomas, Mr. A. Tweedie, and Mr. F. Brayshaw Gilhespy. 5 P.M., LARYNGOLOGY. (Cases at 4 P.M.) Discussion: Common Colds and Their Sequelæ. Openers: Sir Thomas Horder, Sir StClair Thomson, and Dr. J. Freeman. Cases and Specimens will be shown. Members of the Sections of Disease in Children, Epidemiology and State Medicine, and Medicine are specially invited to attend. 8.30 P.M., ANÆSTHETICS. Paper: Dr. Bernard Hollander: Hypnosis and Anæsthesia.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.

MONDAY, Feb. 1st.—5 P.M., Mr. J. P. Hosford: Some Factors in the Causation of Hydronephrosis. (Hunterian Lecture.)

WEDNESDAY.—5 P.M., Mr. R. T. Payne: Excretion Urography. (Hunterian lecture.)

FRIDAY.—5 P.M., Dr. Remington Hobbs: Puerperal Sepsis, with an account of the Treatment of Puerperal Infection by Glycerin Drainage. (Hunterian lecture.)

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Feb. 1st, to SATURDAY, Feb. 6th.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Wed., 4 P.M., Major Meurice Sinclair: Fractures of the Lower Limbs. (Treatment series.)—PRINCE OF WALES'S HOSPITAL, Tottenham, N. Demonstration by Dr. L. R. Yealland, at 2.30 P.M. on Thurs.—LONDON TEMPERANCE HOSPITAL, Hampstead-road, N.W. Demonstration by Mr. Herbert J. Paterson at 2.30 P.M. on Thurs.—CHILDREN'S HEART HOSPITAL, West Wickham, Kent. 10.30 A.M. to 12 noon, Demonstration of Rheumatic Infections and Heart Disease in Children by Dr. Bernard Schlesinger.—CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W. Post-graduate Course in Gynæcology. All day.—ST. JOHN'S HOSPITAL, Leicester-square, W.C. Post-graduate course in Dermatology. Clinics at 2 P.M. and 6 P.M. Lectures on Tues. and Thurs. at 5 P.M.—ROYAL FREE HOSPITAL, Gray's Inn-road, W.C. Antenatal demonstration by Dame Louise McIlroy on Fri. at 5 P.M.—Further particulars from the Fellowship of Medicine.

NATIONAL HOSPITAL, Queen-square, W.C.

MONDAY, Feb. 1st.—2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Denny-Brown: Spasticity, Decerebrate Rigidity, and Allied Conditions.

TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. Dr. Grainger Stewart: Subarachnoid Hæmorrhage.

WEDNESDAY.—2 P.M., Dr. Martin: Out-patient Clinic.

THURSDAY.—2 P.M., Dr. Kinnier-Wilson: Out-patient Clinic. 3.30 P.M., Dr. Riddoch: Subacute Combined Degeneration of the Cord.

FRIDAY.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Mr. Elmquist: Demonstration of Re-educative Exercises. (In Exercise Room.)

GUY'S HOSPITAL, London Bridge, S.E.

MONDAY, Feb. 1st.—5 P.M., Prof. H. A. Harris: The Use of X Rays in Physiological Investigations.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, Feb. 2nd.—3.15 P.M., Mr. McNeill Love: Present Position of Surgery in Tuberculous Conditions.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL.

WEDNESDAY, Feb. 3rd.—4 P.M., Mr. S. Boyd: Demonstration of Surgical Cases.

CITY OF LONDON MATERNITY HOSPITAL, City-road, E.C.

THURSDAY, Feb. 4th.—5.30 P.M., Mr. H. Burt-White: Puerperal Infections.

ROYAL HOSPITAL FOR SICK CHILDREN, Glasgow.

WEDNESDAY, Feb. 3rd.—4.15 P.M., Mr. A. McLennan: Surgical Cases.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.

FRIDAY, Feb. 5th.—4 P.M., Mr. A. Ryland: Œsophagoscopy.

ST. PETER'S HOSPITAL, Henrietta-street, W.C.

WEDNESDAY, Feb. 3rd.—3 P.M., Mr. F. J. F. Barrington: Symptoms and Diagnosis of Carcinoma of the Prostate.

ST. MARK'S HOSPITAL, City-road, E.C.

THURSDAY, Feb. 4th.—4.30 P.M., Mr. J. P. Lockhart-Mummery: The Treatment of Internal Piles.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL, University-street, W.C.

TUESDAY, Feb. 2nd.—5.15 P.M., Dr. E. W. Fish: Pathology of Dentine and the Dental Pulp.

CHARING CROSS HOSPITAL MEDICAL SCHOOL.

SUNDAY, Jan. 31st.—10.45 A.M., Dr. F. H. Young: Chronic Pulmonary Diseases in Children. 11.45 A.M., Mr. C. J. Marshall: Disturbances of Micturition.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark-hill, S.E.

THURSDAY, Feb. 4th.—9 P.M., Dr. E. ff. Creed: Treatment of Septicæmia.

BEDFORD COLLEGE, Regent's Park, N.W.

WEDNESDAY, Feb. 3rd, and following three Wednesdays.—5.15 P.M. (in the Physiological Department), Prof. S. J. Cowell: Modern Aspects of Nutrition.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.

WEDNESDAY, Feb. 3rd.—4 P.M., Dr. D. M. Connan: Social Burden of Rheumatic Disease.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James' Hospital, Ouseley-road, Balham.

WEDNESDAY, Feb. 3rd.—4 P.M., Mr. J. Swift Joly: Retention.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, Feb. 2nd.—5 P.M., Dr. S. E. Dore: Affections of the Hair and Hair Follicles.

THURSDAY.—5 P.M., Dr. J. A. Drake: Urticaria.

ST. MARY'S HOSPITALS, Manchester.

FRIDAY, Feb. 5th.—4.15 P.M. (at the Whitworth-street West Hospital), Dr. C. P. Lapage: Diseases and Abnormalities of the New-born Infant.

FACULTY HALL, St. Vincent-street, Glasgow.

TUESDAY, Feb. 2nd.—4 P.M., Prof. G. B. Fleming: Infant Feeding.

NOTES, COMMENTS, AND ABSTRACTS

POST-VACCINAL ENCEPHALITIS:

ITS ASSOCIATION WITH VACCINATION AND WITH POST-INFECTIOUS AND ACUTE DISSEMINATED ENCEPHALITIS.

BY PROF. RICARDO JORGE,
PRESIDENT OF THE PUBLIC HEALTH COUNCIL OF PORTUGAL.

(*Concluded from p. 219.*)

THE virus of our hypothesis is one which only changes its character of inertia and harmlessness under stimulus by the vaccine virus; apart from this contact there is no evidence of its mysterious existence. Might it not at least be possible to catch a glimpse of some other forms of its activity apart from vaccination? Its existence would then come out of the region of theory and begin to be apparent.

Cerebral complications of such infectious diseases as eruptive fevers, small-pox, measles, and chicken-pox have been long known to classical medicine. Vaccinia forming part of this exanthematic group, it was natural to confront all these forms of encephalitis together. Under the impetus of the questions raised by the nervous sequelæ of the Jennerian inoculation, these cases were no longer looked at as mere clinical incidents, but as documents through which a problem of comparative pathology could be elucidated. It is in England that the greatest progress has been made with the endeavour to bring these forms of encephalitis together. Dr. J. Hutchinson, secretary of the Rolleston Committee, has tabulated the cases brought to his knowledge and has kindly placed at our disposal, together with other useful information, the accompanying Table of fatal cases notified since 1927. Moreover, earlier literature dating back long before the advent of post-vaccinal encephalitis has already also produced some important contributions.

Are these so-called post-infectious types of encephalitis the same as the post-vaccinal? To affirm it on the grounds of clinical similarity alone would be dangerous; the basis of their identification is anatomopathological. Histological examination has shown the identity of lesions in the nervous tissues affected; they present the same Perdrau-Bouman seal as vaccinal encephalitis. This is the pathognomonic test, and in face of it the only cases which one ought to consider as definitely proved are the recent ones which have been submitted to the test of the microscope.

Encephalitis Post Infectionem.

MEASLES.

Measles, the commonest of the group of exanthematic diseases, has provided the largest number of examples. The first known case goes back to 1790 (Lucas, cited by Greenfield [28]). Fresh cases are collected day by day, but it is difficult to decide if encephalitis after measles is in fact becoming more common or whether practitioners are only now becoming more alive to its presence. One may surmise, however, that they are really becoming more common. Ford [23] was able to recover in 1928 113 cases from the literature to which he himself added 12. There were 25 fatal cases in England for the period 1927–30 inclusive, composed in age-groups as follows:—

0– 5 years	16
6–15 ,, ...	8
16 et seq.	1

Greenfield, 1929, published four observations, the most interesting of which have been included in the Further Report.[3] Benn [30] has lately added two fatal cases with autopsies.

Table showing Fatal Cases of Infectious Disease with Nervous Complications, recorded in England, 1927–1930 inclusive.

Malady.		Age-groups. 0–5	6–15	16–	Total.	
INFLUENZA.	Encephalitis	8	9	71	88	99
	Meningitis	4	1	2	7	
	Meningo-encephalitis	2	1	1	4	
MEASLES.	Encephalitis	12	5	1	18	25
	Meningitis	4	2	—	6	
	Poliomyelitis	—	1	—	1	
VARICELLA.	Encephalitis	1	—	—	1	8
	Meningitis	5	—	—	5	
	Convulsions	2	—	—	2	
VARICELLA and WHOOPING-COUGH.	Meningitis	1	—	—	1	
WHOOPING-COUGH.	Encephalitis	2	—	—	2	4
	Meningitis	2	—	—	2	
SCARLATINA.	Encephalitis	—	—	2	2	
SMALL-POX.	,, ...	—	1	1	2	
DIPHTHERIA.	,, ...	—	1	—	1	
	—	—	—	—	142	

In Germany, Lust [31] described in 1926 4 cases, Bergenfeld 1, Shick 4, Redlich 1, Wohlwill [32] 2 in 1928 with post-mortem examination. In Austria two were observed by Bregman and Ponckz. In France, where Comby had observed two cases in 1921, a case in a normal convalescent after measles has recently been demonstrated by Lechelle, Bertrand, and Fauvert before the Société Médicale des Hôpitaux.[33] At the autopsy it was noticed that the demyelinisation was clearly present, though less accentuated than in others described. In Italy, in 1929, a case was recorded by A. Signa and two by Suvinian (cited by Comby [34]). In the United States, Musser and Hauser [35] recorded eight cases in 1928, collected during the course of an epidemic of 351 cases admitted to the New Orleans Hospital; in 1930, Zimmermann and Yannet gave an account of two cases, and in the following year Ferraro and Scheffer six cases.[36] At Rio de Janeiro, Martinho recorded in 1929 a case of post-measles encephalitis attended by himself (cited by Comby [34]). At Montevideo, Morquio [37] published eight personal observations with one death. The types were varied, acute diffuse encephalitis predominating.

This encephalitis following measles presents the following pathological characteristics:

It appears in children, measles being predominantly an infantile disease.

The attack occurs at varying periods after the onset of the measles. It may begin at the very onset of the measles attack. As a general rule, it follows the appearance of the rash at variable intervals—more usually, however, it appears after the defervescence and the rash has disappeared. It has been observed also during convalescence, or several days, or even weeks, after recovery.

Its incidence is not in conformity with the severity of the cases; light attacks can be accompanied or followed by nervous complications. According to Ford, the encephalitis supervenes in four cases out of 1000.

Its fatality is relatively low. Only about 10 per cent. of the cases at most are fatal; recovery is the rule, although often accompanied by sequelæ.

The symptomatology reproduces the forms and the known types of acute encephalitis; the lesional type conforms to Perdrau's scheme. Proof of this has been plainly demonstrated in recent cases submitted to autopsy and controlled microscopically. For example, the cases of Wohlwill; Greenfield's case, the account of which is given at length in the Further Report; and those of Zimmermann and Yannet, of Ferraro and Scheffer, of Benn, and of Lechelle. Each of these has recorded in much the same language, besides the congestion and the

hæmorrhage, a perivascular infiltration, though often very slight, and a typical demyelinisation.

SMALL-POX.

The series of encephalitis cases following small-pox which have been recently recorded are few in number. Nevertheless, knowledge of nervous sequelæ of small-pox dates back for two centuries. Reference is made to them, according to Greenfield, in the writings of Clifton (1724) and Freind (1730) and they have also been observed as following variola inoculation (Dunsdale, 1757) (communication by Dr. Hutchinson). This detail suggests that small-pox inoculation could cause cerebral infections in the same way as cow-pox; nevertheless, even at this distant epoch, if encephalitis complications had been prevalent epidemically among small-pox patients as is the case to-day among vaccinated persons, the circumstances should have been known and recorded. More recent writers recall this occurrence of nervous complication; and among them MacCombie (1905) states that in small-pox the nervous system is more often involved than is the case in other eruptive fevers (cited by Troup and Hurst [33]). Rolleston only found 25 examples out of 10,000 small-pox cases in London in the epidemic of 1901–02.

During the five years 1925–29, 23 cases of death from small-pox accompanied by various nervous complications have been registered in England, and some of these were definitely diagnosed as encephalitis. In two of them the encephalitis was duly confirmed; McIntosh and Scarff described a case of encephalitis following small-pox in 1928, and another, in a man of 63 years, was given by Troup and Hurst.[36] A third case is noted in the Further Report. In all these there was similarity in the clinical facies and identity in the histological findings—a cellular infiltration around the vessels and zones of disappearance of the myelin sheath.

A curious case was cited in the Further Report. A boy vaccinated six days previously fell ill with small-pox; two days after the rash cerebral symptoms appeared but he eventually recovered. It is not clear whether the encephalitis should here be put to the account of vaccinia or variola.

The Ministry of Health has unpublished notes concerning four cases, one of which is interesting, not only because of the age of the patient, 63 years, but because of the precocity of the nervous symptoms which preceded the small-pox eruption by two days. It should be noted that encephalitis can occur in variola minor as well as in variola major; as in the case of measles, it does not depend on the severity of the disease. Nervous complications in the case mentioned in the Further Report arose four days after the onset of small-pox; in the Troup and Hurst case the period was 12 days. In that particular case small-pox ran a normal course in 15 other persons who had been infected from the same source.

VARICELLA.

Encephalitis after varicella has been described by various observers, though cases are not common. In 1924–25 Toni and Galli drew attention to this complication of varicella. D.W.Winnicott and N. Gibbs (1926) and Glanzmann (1927) [39] brought forward some new cases, and the latter considered their pathogenesis. Wilson and Ford [40] in 1927 recorded three histories all ending in complete recovery.

Bertoye and Garcin in 1929, Robert Rendu in 1930, and P. Gauthier in 1931, recorded similar cases (cited by Comby [34]).

Rake [41] described a very clear case in connexion with which he makes a survey of known literature. Tramer [42] also records a case with encephalitic symptoms. Eight cases have been recorded by the English Ministry of Health, all in infants below 5 years of age. Bouman has recently mentioned a case after varicella which he considered quite characteristic, followed by recovery, in a child of 4 years of age who had never been vaccinated (communication of Dr. Jitta). Babonneix [43] attributes to encephalitis the convulsive attacks of Jacksonian type which occurred in two infants with varicella. He also mentions another case, also after varicella, with complication of symptoms. The period of incubation is said to vary from five days from the appearance of the rash to 15 days and even more. The prognosis is quite favourable. There have been no autopsies, so that the diagnosis of typical encephalitis can only be assumed.

MUMPS.

It has long been known that epidemic parotitis can be accompanied by meningo-encephalitic phenomena. Acker, in 1913, was able to collect 30 fatal cases, and several came to light during the war. Bedingfield (1927) [44] described a case, and refers to previous literature on the subject. K. Holtz has (1931) given an account of another case with meningeal symptoms occurring two days after the swelling of the right parotid, and has collected 16 fatal cases since 1916. A benign form would appear to be usual in children; the condition seems to be more severe among adults.

The cerebral manifestations occur after the swelling of the parotid, though it seems that sometimes they may precede the appearance of the parotitis. No deaths and no autopsies.

GERMAN MEASLES.

Pierret and Le Marc'Hadour [45] in July, 1931, described to the Société de Médecine du Nord a case of meningo-encephalitis occurring during mild measles with death after 36 hours. A similar case had been described by Brock [46] in 1929. Debré, Turquéty, and Broca [47] also dealt with this type of encephalitis in 1930 on the basis of two observations. In both, though the affection was well-marked, recovery was rapid. Babonneix [43] described a case following rubeola accompanied by diffuse lesions in the nervous system and terminating fatally after a protracted development.

No autopsies have been recorded which would determine the precise nature of the affection.

INFLUENZA.

In influenza we have a virus endowed with a selective affinity for the nerve centres. Post-influenzal encephalitis occurs more or less frequently during the course of the great pandemics of influenza, and also during the ordinary seasonal recrudescence. So well was this realised that at the time that encephalitis lethargica made its appearance, it was considered natural to regard it as dependent on the universal influenza epidemic of 1918. The British statistics record 99 fatal cases during the period 1927–30, the great majority being adults.

Much has been written on post-influenzal encephalomyelitis and its lesions, but what interests us for the moment is to know whether from recent autopsies it has been possible to discover histological lesions similar to those of post-vaccinal encephalitis. Two cases in adults, studied by Greenfield, were published in the Further Report; one was fatal five days, and the other seven weeks, after the appearance of the encephalitis. The post-mortem examination revealed the same lesional picture as in encephalitis following other infections—cellular infiltration round the vessels with concomitant demyelinisation. McAlpine was of opinion that the second case was one of idiopathic encephalitis rather than due to influenza. One might, however, consider it more probable that a light and simple infection, such as an angina, a cold, or bronchitis, can originate the encephalomyelitis, whether influenzal or not (G. Buchanan, Report of the Small-pox Committee, 1930).[3]

Influenzal encephalitis in the light of the earlier reports appears to be of a complex and variable nature. The vascular lesions—congestion and hæmorrhage—are very pronounced, and the inflammation may even at times become purulent.

OTHER INFECTIONS.

One cannot pass without remark the occurrence of neuro-paralysis in persons who have undergone the Pasteur treatment after being bitten. These disorders of the nervous centre, recognised since the beginning of antirabic treatment, are rare and do not appear to be attributable to the rabies vaccine. The lesions appear to be quite similar to those of post-vaccinal encephalitis, as Basson and Grinker,[48] among others, have shown in a fatal encephalopathic rabio-vaccinal case.

Mention has also been made of cerebral complications following scarlatina, whooping-cough, diphtheria, &c.

Acute Disseminated Encephalitis.

The title and description of this condition date from the work of Westphal (1872).[49] Further interest in it has recently been stimulated by the view that all the post-infectious types of encephalitis should be classed according to their clinical and anatomical characteristics as special types of acute disseminated encephalitis. Acute disseminated encephalitis has recently occurred rather in an epidemic fashion, though it has seemed to arise spontaneously and not by any known infectious condition. Consequently there is a special interest in considering these cases in relation to theories of post-vaccinal encephalitis.

Redlich,[50] in 1927, published 13 cases, discovered over a period of three years. Those attacked were for the greater part adults of over 30 years of age and were attacked during the winter months. All of them were restored to good health. In the same year, Pette reported 25 similar cases occurring at Hamburg (cited by Flatau [51]). Flatau records 17 observed cases collected at Warsaw and in other towns during the first half of 1928—an epidemic series of cases with similar symptoms and certain peculiarities. Children and young persons were most frequently attacked. The progress of the disease was benign, and there were only two deaths. The clinical characteristics enabled the condition to be identified with disseminated encephalitis. Histological examination in the only autopsy confirmed the clinical diagnosis. Analogous observations have been published by Brain and Hunter (1929),[52] Martin (1928), Spiller (1929), Strauss and Rabiner (1930).[53]

McAlpine [54] has recently given a detailed clinical picture and account of the lesions in acute disseminated encephalitis, taking earlier work and deductions into account. He adds a set of four occurrences of sequelæ which were more or less severe. An apple of discord is here thrown among the neurologists; multiple sclerosis presents, although rarely, a form characterised by its rapid evolution and a general dissemination of the morbid process (Cournand); and the question has arisen whether this variety should be fused with the other forms of disseminated encephalitis or should remain in its separate place. McAlpine takes the second view: that acute multiple sclerosis and disseminated encephalitis, in spite of their similarities, depend on different viruses. On the other hand, Cournand, in his detailed monograph on acute sclerosis,[55] regards their identity as proved by the similarities of the histological lesions with those which have been established for disseminated encephalitis, whether post infectionem or spontaneous. Two personal observations, with sections and reference to Pette's cases, supported this identification of multiple sclerosis and disseminated encephalitis.

Conclusions of Part II.

Practically all the authors cited accept, more or less, the doctrine of unity: that one type of virus only is the cause of acute disseminated encephalitis, whether it is deuteropathic (post-vaccinal or post-infectious) or protopathic (spontaneous). This virus, which it has not yet been possible to isolate or handle, must in essence be characterised by its elective affinity for the myelin sheath which undergoes disintegration (demyelinisation). It acts by itself in spontaneous encephalitis, whereas in those following infections it comes into action in the wake of another virus—vaccinia, measles, variola, varicella, &c.—which open the way for it, or enable it to pass from a latent condition to one of infectious activity.

One can no longer refuse the admissibility of this hypothesis, since it is justified by so considerable a dossier of well-established facts and nearly all writers entertain it. Some of them consider the hypotheses of identity as highly probable and others (like Pette, Perdrau, Cournand) definitely assert it. The facts brought forward to support it are certainly striking, although it must be admitted that there are also some discordances to consider. The following may be mentioned:—

(1) While post-vaccinal encephalitis is of recent date, forms of encephalitis post infectionem have long been known, some of them for over a century. The same applies to acute disseminated encephalitis.

(2) The frequency of post-vaccinal encephalitis is much greater, in the countries affected, than is that of post-infectious or disseminated encephalitis. It seems, however, that cases of the latter may be on the increase.

(3) No concomitance in time and place among these different forms of encephalitis has been observed; the post-vaccinal series are not accompanied by cases of disseminated or post-infectious encephalitis, or vice versa. In the Dutch centres, for example, encephalitis was only found among those who had been vaccinated, and not at all among those associated with them.

(4) A relatively constant period of incubation, which is shown in the post-vaccinal cases, is not evident in post-infectious encephalitis. It may be, however, that we have not yet sufficient numerical data on this matter.

(5) The fatality is much higher in post-vaccinal encephalitis than in the others. Disseminated encephalitis is, indeed, conspicuous by its benignity.

(6) Post-infectious and disseminated forms of encephalitis are often followed by sequelæ, whilst in the post-vaccinal these are very much rarer.

(7) The anatomical similarity is not in all respects complete. In addition to the perivascular infiltration and the demyelinisation, one meets with different somatic lesions, such as signs of intense inflammation and hæmorrhages, particularly in the case of the post-infectious encephalitis.

It may be that some of these differences will be effaced as observations continue and increase. The materials are scanty owing to the relative rarity of all these kinds of encephalitis; cases still go undetected, and very few are observed throughout their course and completed by autopsies.

Direct proof of the existence of a single virus for all these forms of encephalitis—one which would remove all doubts—has still to be furnished and may be long in coming. The conception of unity rests on the identity of the lesions, and is based on the myelin proof. On the other side, it may on principle be urged that the same histological process can be engendered by diverse infections, by diseases which are very different in respect of their ætiology. The histological proof in itself is hardly sufficient to carry full conviction. But if in place of unity one assumes *plurality of the viruses*—that is to say, that each encephalitis, post-vaccinal, morbillar, varicellar, variolous, &c., is due to its own virus which, as the result of its neurotropism, has succeeded in attacking the nervous centres—one has then to ask if it is reasonable to suppose that so many different viruses would attack the nerve tissues in the same manner, with the same localisation, the same selectiveness, and the same microscopic characteristics.

The assumption of a single encephalitogenic virus which is associated with the different viruses of these diseases followed by nervous complications seems to be in more logical accord with the facts known up to now. It is, however, simply a provisional synthesis resting at the mercy of scientific progress, which, by confirmation or invalidation, will give us better and surer conceptions. These we must be ready to entertain without tying ourselves to preconceived opinions.

At least the main lines of the problem have now become clear and fruitful results have been obtained

by pursuing them. It is greatly to be hoped that they will be pursued; that, on the one hand, the investigators will persevere in the study of experimental encephalitis and, on the other hand, that the course of post-infectious and disseminated encephalites will be closely followed. All these studies should be vigilantly watched. They already come under official supervision in England, Holland, Germany, Sweden, and elsewhere. Medical practitioners should notify any cases recorded by them in order to obtain an examination by an expert neurologist, laboratory determinations, and, in fatal cases, a post-mortem examination by an expert in the pathology of the nervous system. The Ministry of Health in England has recently addressed to practitioners a request that they will communicate without delay all cases with acute infection of the central nervous system which have occurred within four weeks after vaccination, or in which the symptoms have immediately followed an acute infectious disease. All such collections of carefully made observations will bring us nearer to wider and exacter knowledge.

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SALE AND PURCHASE OF PRACTICES.

WE have received from Mr. Percival Turner a little volume which is a partial reprint of the "Guide to the Medical and Dental Professions" which he wrote some years ago and which is now out of print. These "Hints," as the author terms his excerpts, relate particularly to the sale and purchase of medical and dental practices and partnerships, and include much information given in the previous publication, when it remains relevant to existing circumstances. We may draw attention to the fourth chapter which sets out the circumstances for the employment of assistants and locum-tenents, for every practitioner knows there are many difficult positions that may arise in these relations, such as the death or bankruptcy of the principal or the employee, the failure of one or other party to keep the terms of the contract, the misunderstanding of agreements for special services, travelling expenses, and so on. Mr. Turner gives wise counsel on these and analogous points out of his long experience.

PROBLEMS OF WATER POLLUTION.

FOUR years ago the Water Pollution Research Board of the Department of Scientific and Industrial Research began to issue a monthly series of abstracts on sewage, water-supply, and pollution. In the Board's latest report * Sir Robert Robertson remarks that these are stimulating industrial concerns and individuals to carry out experimental work on their own problems. The first number of the new volume of 123 abstracts † contains a note on the hygienic control of public baths in Greater Berlin, the water of which is required to be clear, to be free from the colon bacillus in 100 c.cm., and to contain not more than 200 bacteria per c.cm., the content of free chlorine being not less than 0·1 and not more than 0·5 parts per 1,000,000. The replacement of chlorination by treatment with copper or silver (whether or not in the form of catadyn is not stated) was tried in some cases, and copper alone was found to reduce troubles from smell. Swimming-bath conjunctivitis has not appeared in these baths for some years. In another note it appears that the water-supply of Los Angeles is so critical that the reclamation of sewage has been investigated. We are familiar with the necessity of using a circulating system for the water-supply of many modern country bungalows, but the possibility of converting sewage into a normal supply of drinking water goes far beyond this. It seems to be proposed to maintain the ground-water level in this way.

ULRICH ELLENBOG.

REFERENCE was made in THE LANCET (1931, ii., 809 and 997) to a fifteenth century treatise on industrial hygiene mentioned by Dr. L. Carozzi in his historical review of occupational diseases.[1] It may be of interest to note that this was reprinted in facsimile in 1927 [2] from the only known copy of the first issue in Munich University Library. A copy of this reprint is in the library of the London School of Hygiene and Tropical Medicine. Preceding the facsimile is an account, by Friedrich Zoepfl, based on his longer article,[3] of the life and work of Ulrich Ellenbog (not Ellembog, as Dr. Carozzi spells it). The name is probably derived from Ellenbogen in Vorarlberg, Austria, about 30 miles east of Ulrich's birthplace, Feldkirch. He was educated at the universities of Vienna, Heidelberg, and Pavia, graduating as Doctor of Medicine at the last named in 1459. He then returned to his home town of Feldkirch. Later he occupied an official position as physician to the Cathedral in Augsburg, where his treatise was written. He was a devoutly religious man and paid particular attention to the religious education of his 11 children, four of whom later entered the service of the Church. He died in 1499. Three of his works were printed, four are known only in manuscript, while five others are lost. A short account of the present pamphlet from the medical point of view has been provided by Franz Koelsch, who claims for it the distinction of being the first work on industrial hygiene in the literature of the world. A typographical study follows from the pen of the editor, who concludes that although the work was written in 1473 it was not printed till 1524 by Melchior Ramminger in Augsburg.

Since the reprint itself is not easily accessible, and Ellenbog's fifteenth century Swabian is not such easy reading as modern High German, Mr. Cyril Barnard, Librarian of the London School of Hygiene and Tropical Medicine, has made a translation of the text; this occupies only eight small pages in the original, and the translation is complete.

THE TREATISE.

On the poisonous evil vapours and fumes of metals such as silver, quicksilver, lead, and others that the

* Report of the Water Pollution Research Board. H.M. Stationery Office. 9*d*.

† Summary of Current Literature. Ibid. 2*s*. Annual subscription 24*s*. post free.

noble craft of goldsmiths and other workers must use in the fire. How they shall deal therewith and drive away the poisons.

To the skilful, subtle and noble craft of Goldsmithery of the Imperial City of Augsburg.

MY willing devoted service be ready for you all. As I, Ulrich Ellenbog, Doctor of Physick, of Feldkirch, now Physician to the Dean and Chapter of Augsburg Cathedral, have observed the great, severe and remarkable harm whereto this skilful craft cometh through the fumes and vapours of the things wherewith the said craft hath to work, so I could not withhold or refrain from giving advice for the service and help of the craftsmen, that they come not to such grievous harm or disease through these fumes. Also I pray you, masters and men, that ye take in all good part and friendship this my little advice, written with mine own hand, then the readier will I be with friendly services to you each and all who command and work. Given at Augsburg the 6th day of October, 1473.

Of the fire of coals.—In your subtle craft ye use coals for the fire. The smoke or vapour of the same is poisonous and particularly if the coals be somewhat damp, for this vapour burdeneth the head and also the chest, especially if one be near it for long, and when one tarrieth there too long, the sight waxeth dim, so that it seemeth as if there be green and blue and such like before his eyes, or flies in the air. This vapour also maketh heavy, unnatural sleep and ofttimes heavy limbs, and if one be therein for long he becometh palsied. Therefore burn not much damp coal, let it kindle in the open air. In winter time when ye have coal fire in the workshop, shut not the windows and guard yourselves from this vapour so far as ye may, is my advice. The writings shew that it is quite poisonous and deadly to live and sleep for long in a closed room with this coal-vapour. As many masters in physick prove this, for brevity's sake it needeth not be pointed out. If ye craftsmen will use coal fires, first kindle and blow them up in the open air, then lay white incense therein or sprinkle a little wine thereon. So will the poison and harm of this vapour be lessened.

Of the vapour of quicksilver, lead and other metals wherewith goldsmiths do use to work.

The writings of physick hold that the vapour of every thing retaineth the nature, complexion and power of the body whence it issueth. Wherefore are the apothecaries wont to make distilled waters that are of a hot nature when they take hot herbs, and from cold herbs they distil cold waters. Wherefore is it also that the smoke or vapour of each metal retaineth the complexion, nature and power of the metal wherefrom it issueth. And often the vapour or smoke is stronger, mightier and sharper than his mineral, metal or body, as one manifestly seeth if one sublimate aqua fortis, also if one distil brandy, for the vapour is much stronger than the sal ammoniac alone, etc., or also the wine wherefrom the brandy is made. Wherefore men call and name the vapour spirits, that is ghosts, for through their sharpness, strength and subtlety, they always penetrate and work more strongly than the body wherefrom they are drawn. Now it is apparent in the writings of nature that quicksilver is right cold and wet in his complexion and also action, also that lead is cold and wet, likewise that silver is of a cold nature, likewise litharge and antimony are cold. Wherefore I say that the smoke and vapour of the said metals chilleth greatly the man who hath to work therewith. Wherefore when ye masters and men work silver with lead, or gild, ye shall guard yourselves as far as ye may from the vapour and smoke, for it is poisonous to you, and it is my advice that ye do it in the open air with all diligence, and not in a closed room. Also ye shall not bend too much over this vapour but turn away therefrom and bind up the mouth. This vapour of quicksilver, silver and lead is a cold poison, for it maketh heaviness and tightness of the chest, burdeneth the limbs and ofttimes lameth them as often one seeth in foundries where men do work with large masses and the vital inward members become burdened therefrom.

How One Shall Lessen and even Turn Aside the Harm of these Vapours.

Dear masters and men, when ye refine or gild, have musk by you, and ye shall smell of this much and often, for the vapour of the musk quelleth and suppresseth by his warmth the coldness of the smoke from silver, lead and quicksilver. Also the musk, by the property that it hath of strengthening the vital members of the heart and brain, wardeth off and assuageth the harm from the vapour of lead and quicksilver, therefore the same vapour cannot harm you so. Likewise what time ye goldsmiths be in the aforesaid fumes, keep in your mouths one of the following pieces, which ye will, and chew it, so by the strength of these pieces will be corrected and lessened the poisoning of the vapour that ye draw in with the air for your breath. Thus the said vapour cannot so harm you as if ye held not the pieces or their like in your mouths. And these are the pieces: juniper berries, rue, dittany, that is a pure white root, tormentil, elecampane.* Many other pieces are commended by the physicians against these poisonous vapours, but these aforesaid seven pieces are good for you, also common enough that ye and everyone can get them at small cost. Some teachers of physick highly commend the emerald, which one shall also hold in the mouth, for it withstandeth the poisoning of this vapour. Also, dear craftsmen, if one of you in gilding or refining hath inhaled much vapour, so that he feeleth distressed or feareth harm, he shall on the morrow, fasting, sweat in bed and then take a good old theriac such as a large hazelnut with rue-water or speedwell-water or wine, thus will the poisoning be driven out of him, which hath entered him in refining or gilding. The doctors also recommend that ye shall after refining or gilding drink wormwood wine, for by the warmth and heat of the wormwood the chilling of the said vapours will be suppressed. Moreover wormwood hath the property that it withstandeth the poisoning. And he who hath no wormwood wine in his cellar may in a day or seven hours make it by dropping wormwood into wine. If however one cannot sweat in bed, he shall go on an empty stomach to the bathroom and take the theriac as before directed.

Against the vapours of aqua fortis which are warm, hot and right sharp, and against the vapours of litharge and antimony, which are of a cold nature, ye shall guard yourselves specially well as is described above for lead and quicksilver. Also some teachers say one shall eat garlic before and after against suchlike poisonous vapours.

Against the vapours of verdigris, saltpeter, and sal ammoniac guard yourselves right well because when ye fire pale gold, then these vapours are very hot, sharp and poisonous. To correct and lessen their poisoning thou shalt drink half a dram of bole mixed with wine and rosewater. Herewith God keep us all sound. Amen.

REFERENCES.

1. Carozzi, L.: Occupational diseases. Historical review. Occupation and Health. Encyclopædia of Hygiene, Pathology and Social Welfare, studied from the point of view of Labour, Industry, and Trades. Brochure No. 254. Pp. 17. Geneva: International Labour Office. 1931.
2. Ellenbog, Ulrich: Von den gifftigen besen Tempffen und Reuchen. Eine gewerbe-hygienische Schrift des XV. Jahrhunderts. Wiedergabe des ersten Augsburger Druckes mit Biographie und einer medizin- und druckgeschichtlichen Würdigung von Franz Koelsch und Friedrich Zoepfl. München: Verlag der Münchener Drucke. 1927, 8vo, pp. xx., 12. (Münch. Beiträge zur Geschichte und Literatur der Naturwissenschaften und Med. Herausgegeben von E. Darmstaedter. II. Sonderheft.)
3. Zoepfl, Friedrich: Archiv für die Geschichte des Hochstifts Augsburg, Dillingen a.d. D., 1916, Bd. V. (Cited from 2, p.v.)

HYPODERMIC NEEDLES OF BRITISH MANUFACTURE.

WE have received from British Surgical Industries, Ltd., 14, Regent-street, London, samples of their hypodermic needles in stainless steel with gold finished mounts. These are also made in the finest quality of Sheffield steel with silver finished mounts. The specification of the needles supplied to us is size 15, 28 mm., bore ·37. The aim of the firm is to supply the profession with dependable articles at lower prices than are now charged for those of foreign origin.

A PHOTOGRAPHIC RECORD OF RADIUM CASES.

THE radium workers at the Middlesex Hospital have conceived the interesting idea of publishing a photographic record of some of their successes and failures.[1] As they point out in their preface, radiotherapy is in its infancy, and a record of the results obtained at this stage may prove of great value in the future. The bulk of the book consists of very beautiful untouched photographs of superficial malignant growths before and after the application of radium. The cases are classified as carcinomata (squamous-celled, basal-celled, spheroidal-celled), sarcomata, and miscellaneous (lupus vulgaris, lupus carcinoma, and odontoma). Each photograph has a

* Two others are mentioned, which I have been unable to identify.—C. C. B.

[1] Some Radium Cases at the Middlesex Hospital: A Photographic Record. By A. Cameron Macleod, M.B., B.S., F.R.C.S. The Middlesex Hospital Press. John Murray, 1931, pp. 154, 7*s.* 6*d.*

brief clinical note attached to it. There is a short history of the technique employed at the Middlesex since 1912, and each section of photographs is introduced by two or three pages of letterpress on the technique employed and the results obtained.

PRACTITIONERS' REGISTER OF DANGEROUS DRUGS.

WE are informed that there is still some misapprehension about the requirements of the Dangerous Drugs (Consolidation) Regulations concerning the keeping of registers by medical practitioners who do *not* dispense or supply drugs to their patients. Every such medical practitioner who obtains the drugs for whatever purpose is, by No. 11 (1) (A) of the Regulations, required to keep a register in the form set out in the second schedule to the Regulations and enter therein true particulars with regard to every quantity of any of the drugs obtained by him at the time he obtains them.

STAINING SMEARS FOR THE MICROSCOPE.

THERE are many small pedantic practices which take up much time and might well be replaced by something simpler. Where for example, microscopical control is of decisive importance in diagnosis the usual plan is to take a smear and lay it by for further treatment and investigation. To simplify these operations Dr. Felice Marta,[1] of Milan, uses an ordinary copying pencil. The smear being obtained, the tip of the pencil conveys a drop of water on to the slide beside it. In a few seconds the drop is adequately coloured by the pencil, and it is then allowed to glide over the smear which rapidly absorbs the stain. When dried, the smear shows uniform staining with clear definition of cells and nuclei, transparent in the free spaces, and especially an intense colouration of the microbic elements which Dr. Marta says is more distinct than that obtained by the usual colouring agents. The make of pencil is of no importance, but its colour is; the best results are obtained by blue, violet, or green, the colour being due to acidity or alkalinity of the aniline pastel, while red and yellow show admixture with earthy substances.

INDEX TO "THE LANCET," VOL. II., 1931.

THE Index and Title-page to Vol. II., 1931, which was completed with the issue of Dec. 26th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

Appointments

THOMAS, L. GLYNNE, L.R.C.P. Lond., M.R.C.S., has been appointed Resident Asst. M.O., Infectious Diseases Hospital, Birkenhead.

London County Council: SIMMONS, J. H., M.B., B.S. Lond., Assistant Medical Officer, St. Giles' Hospital; CARROLL, J. V., M.B., B.Ch. Dubl., D.P.H., Assistant Medical Officer, Park Hospital; BENSON, V. C., M.R.C.S., L.R.C.P. Lond., Assistant Medical Officer, Grove Park Hospital; MOWLEM, R., F.R.C.S., M.B., Ch.B., Assistant Medical Officer, Hammersmith Hospital; MUIR, C., M.B., Ch.B. Edin., Assistant Medical Officer, King George V. Sanatorium; SCOBIE, W. H., M.B., Ch.B., D.P.H., Assistant Medical Officer, Downs Hospital for Children; EVANS, T. J., M.B., B.Ch., D.P.H., Assistant Medical Officer, St. Luke's, Lowestoft; HEATHER, J. C., M.B., B.S., Assistant Medical Officer, St. George-in-the-East; TAYLOR-JONES, Miss E. L., M.R.C.S., L.R.C.P., House Physician, St. Olave's Hospital; STANLEY, Miss S. M., M.B., B.S. Lond., House Physician, St. Olave's Hospital; WHITE, Miss J. E. M., M.R.C.S., L.R.C.P. Lond., Clinical Assistant, St. Mary Abbots Hospital; GREENWOOD, W. P., M.B., B.S., Medical Superintendent, Bethnal Green Hospital; WEST, H. O., M.B., B.S., D.P.H., Medical Superintendent, Archway Hospital.

[1] Il Policlinico (Practical Section), Jan. 4th.

Vacancies

For further information refer to the advertisement columns.

Ashton-under-Lyne, District Infirmary.—Anæsthetist.
Birmingham City Mental Hospital.—Jun. Asst. M.O. £350.
Birmingham, Queen's Hospital.—Cas. Surgeon. £100.
Birmingham, Selly Oak Hospital.—Biochemist. £400.
Birmingham and Midland Eye Hospital.—Res. Surg. O. £150
Bootle General Hospital, Derby-road.—Hon. Dental Surgeon.
Bradford Royal Infirmary.—Two H.S.'s. Each at rate of £135.
Bristol Royal Infirmary.—H.P.'s and H.S.'s to Special Depts. Each at rate of £60. Also Cas. H.S. At rate of £100.
British Institute of Radiology, 32, Welbeck-street, W.—Sub-Editor.
Cambridge, Addenbrooke's Hospital.—H.P. At rate of £130.
Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Asst. Surg. Also Third Res. H.S. At rate of £75.
Dorchester, Dorset County Hospital.—H.S. At rate of £160.
East London Hospital for Children, Shadwell, E.—Dermatologist.
French Hospital and Dispensary, 172, Shaftesbury-avenue, W.C. Gynæcologists.
Glasgow, Harry Stewart Hutchison Prize.—£50.
Glasgow University.—Dr. Robert Pollok Lectureship in Materia Medica and Therapeutics. £500.
Grimsby and District Hospital.—H.S. £200.
Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—Asst. for Dept. of Path. £350.
Hospital for Sick Children, Great Ormond-st., W.C.—Cas. O. £400.
Hostel of St. Luke, 14, Fitzroy-sq., W.—Res. M.O. At rate of £200.
Kendal, Westmorland County Hospital.—H.S. At rate of £200.
Kettering and District General Hospital.—Res. M.O. At rate of £200.
Leicester, City Mental Hospital, Humberstone.—Second Asst. Res. M.O. £400.
Liverpool, Fazakerley Sanatorium (Tuberculosis).—Asst. Res. M.O. £250.
Liverpool, Royal Southern Hospital.—Cas. O. At rate of £100. Also Two H.S.'s, M.O., and Res. Anæsthetist. Each at rate of £60.
London Temperance Hospital, Hampstead-road, N.W.—Med. Reg. 40 gns.
Manchester, Ancoats Hospital.—Two H.S.'s. Each at rate of £100.
Manchester Hospital for Consumption and Diseases of the Throat and Chest.—Res. M.O. for In-patient Dept. £200.
Norwich, Norfolk and Norwich Hospital.—H.S. £120.
Nottingham Children's Hospital.—Res. H.P. At rate of £150.
Nottingham Hospital for Women.—H.S. At rate of £150.
Oxford County and City Mental Hospital, Littlemore.—Asst. M.O. £400.
Preston and County of Lancaster Royal Infirmary.—H.S. At rate of £150.
Princess Beatrice Hospital, Richmond-road, S.W.—Anæsthetist.
Queen Mary's Hospital for the East End, E.—Hon. Asst. Surgeon and Physician.
Queen's Hospital for Children, Hackney-road, E.—Surg. to Ear, Nose, and Throat Dept.
Richmond, Surrey Royal Hospital.—Third Hon. Anæsthetist.
Royal London Ophthalmic Hospital, City-road, E.C.—Three Refraction Assistants. Each £100.
Royal Northern Hospital, N.—Obstetric H.S. At rate of £70.
St. Thomas's Hospital.—Phys. to Out-patients.
Salford Royal Hospital.—Gen. Supt. and Sec. £600.
Salisbury, General Infirmary.—H.P. £150.
Sheffield Royal Infirmary.—Ophth. H.S. At rate of £80.
Walsall General Hospital.—Sen. Res. O. At rate of £400.
West London Hospital, Hammersmith-road, W.—Non.-Res. Cas. O. £250. Hon. Obstet. Reg. Also Hon. Asst. Anæsthetist.
York County Hospital.—H.S. to Ear, Eye, Nose, and Throat Dept. £150.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Bridgend (Glam.) and at Framlingham (Suffolk).

Births, Marriages, and Deaths

BIRTHS.

CORY.—On Jan. 20th, at Bury St. Edmunds, the wife of Dr. J. W. E. Cory, of a son.

DEWHURST.—On Jan. 21st, at Shawfield, Havant, the wife of Dr. M. S. Dewhurst, of a son.

PLATT.—On Jan. 23rd, the wife of Harry Platt, M.S., F.R.C.S., of Newbury, Victoria Park, Manchester, and Ronda Cottage, Prestbury, Cheshire, of a daughter.

MARRIAGES.

TAYLOR—PRATT.—On Jan. 14th, at Marylebone Register Office, Alexander Giles Cameron Taylor, M.R.C.S., L.R.C.P., of Bellefields, Englefield Green, Surrey, to Norah, only daughter of the late A. H. Pratt, and of Mrs. Pratt, of Epsom.

DEATHS.

CRAVEN.—On Jan. 16th, suddenly, at a nursing home in London, Walter Craven, M.R.C.S., L.R.C.P., late of Umtali, Southern Rhodesia.

HENDLEY.—On Jan. 21st, suddenly at The Thatched House, Caxton, Cambridge, Major-General Harold Hendley, C.S.I. (I.M.S., retired), in his 71st year.

HENSHAW.—On Jan. 20th, at Shawfield-park, Bromley, Kent, Harry Williams Henshaw, M.R.C.S., L.R.C.P., D.P.H., aged 63.

SHUTE.—On Jan. 20th, 1932, suddenly, at Granby-place, Northfleet, Geo. Sidney Shute, M.D., aged 69 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.